23 MAY 1932

Annual Forest Administration Report of the Bombay Presidency including Sind

For the Year 1930-31

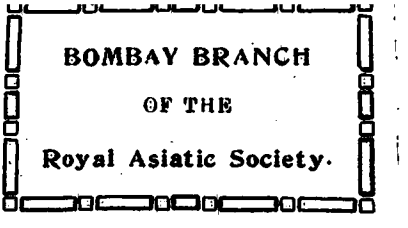
Part I

LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY.

[Price—Annas 9 *or* 11*d.*]

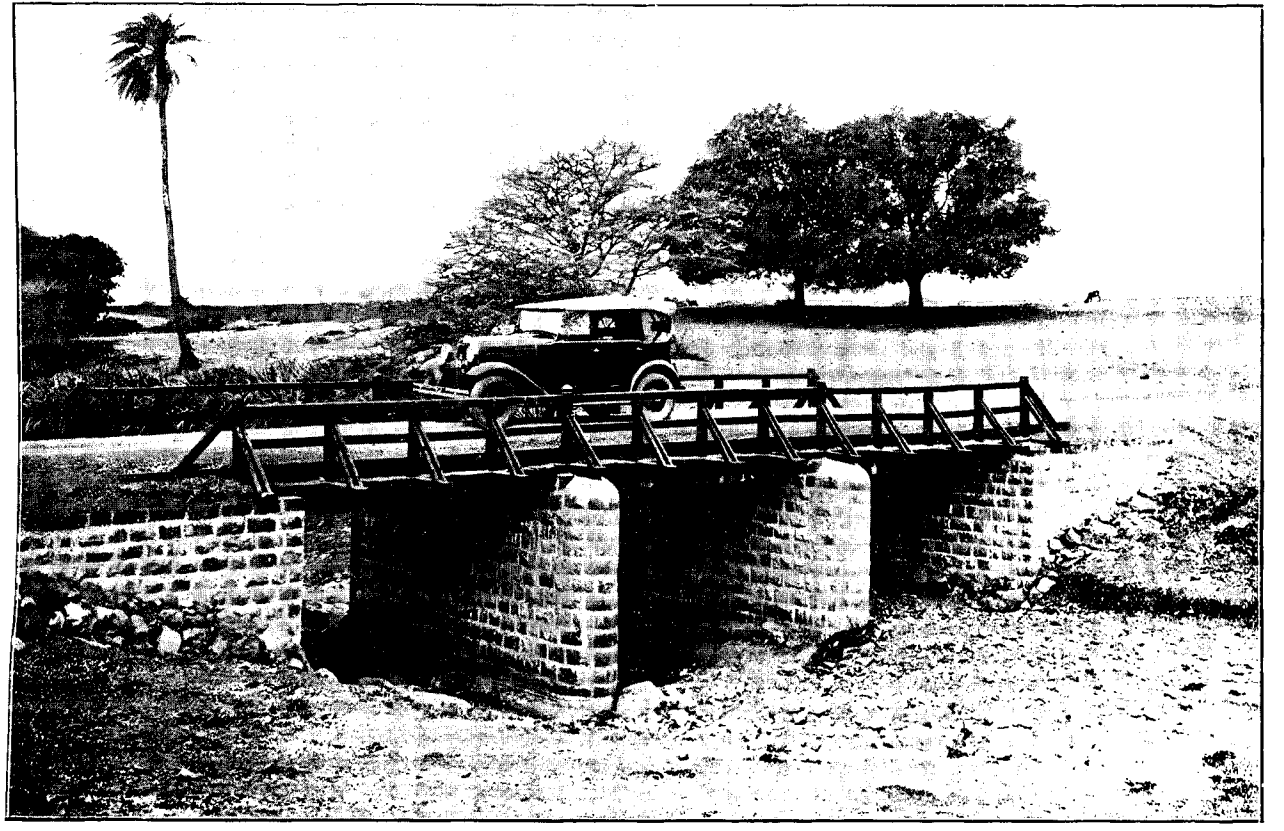
BOMBAY
PRINTED AT THE GOVERNMENT CENTRAL PRESS
1932

Obtainable from the Superintendent, Government Printing and Stationery, Bombay, or through the High Commissioner for India, India House, Aldwych, London, W.C.2, or through any recognized Bookseller



Digitized with financial assistance from
Government of Maharashtra
on 24 February, 2020

LIBRARY
OF THE
BOMPAY
BRANCH
OF THE
ROYAL ASIATIC SOCIETY.



BRIDGE WORK.
Wet lime masonry bridge near Pimpri village in the West Nasik Division on Wani Hatgad road. Cost Rs 3,325.

G. P. Z. P. 1932

TABLE OF CONTENTS

PAGE

CHAPTER I.

CONSTITUTION OF STATE FORESTS.

1. Alteration in area 1
2. Forest Settlements 2
3. Demarcation 3
4. Forest Surveys 3

CHAPTER II.

MANAGEMENT OF STATE FORESTS.

1. Regulation of Management—Preparation and control of regular working plans; and preliminary working plan reports 3
2. Communications and Buildings—
   (*a*) Roads and Bridges 5
   (*b*) Buildings 5
   (*c*) Miscellaneous works 5
3. Protection of Forests—
   (*a*) General protection 6
   (*b*) Protection from fire 7
   (*c*) Protection from cattle 10
   (*d*) Protection against injuries from natural causes 12

CHAPTER III.

SILVICULTURE.

1. Afforestation and Regeneration of Forests—
   (*i*) General progress of areas under regeneration 13
   (*ii*) Establishment of reproduction under working plans or schemes—
      (*a*) Mainly natural 14
      (*b*) Mainly artificial 15
      (*c*) Afforestation 16
   (*iii*) Plantations and other forms of regeneration not under working plans or schemes 17
   (*iv*) Tending 18
   (*v*) General 18
2. Tending of the growing stock 19

CHAPTER IV.

EXPLOITATION.

(*a*) System of Management—
   (*i*) Major Forest Produce 20
   (*ii*) Minor Forest Produce 20
(*b*) Agency of Exploitation—
   (*i*) Departmental agency 21
      Timber depôts 22
      Firewood depôts 24
      Private saw-mills 24
      Cart depôts 24
      Messrs. Howard Brothers' Timber Agency 24
   (*ii*) Purchasers 25
   (*iii*) Rights, Privileges and Free grants 27
(*c*) Outturn and sources of Forest Produce 28

PAGE

CHAPTER IV-A.

ENGINEERING BRANCH.

1. Surveys 29
2. Designs and Drawing work 29
3. Road and Bridge construction 30
4. Forest Exploitation—
   (*a*) Mechanical extraction 30
   (*b*) Saw-mills 31

CHAPTER V.

Financial results 38

CHAPTER VI.

Research and Experiments 47

CHAPTER VII.

Administration 56

CHAPTER VIII.

General 63

LIST OF ILLUSTRATIONS

Serial No.	Description	Facing page
I	*Bridge work.*—Wet lime masonry bridge near Pimpri village in the West Nasik Division on Wani-Hatgad road. Cost Rs. 3,325	Frontis-piece
II	A view of the Masonry Causeway over the Bawlazaru Nallah in Kanara Northern Division ..	5
III	*Artificial regeneration in riverain areas.*—Babul in Budhka Forest—Karachi Division—5½ months old. 3′ high	13
IV	*Erosion.*—Ghotane forest—Halla Range—Hyderabad Division. Babul trees falling into the Indus before the erosion strip contractor has time to fell and remove them	13
V	*Artificial Regeneration.*—Babul in single furrows—Khirsar Forest—Karachi Division—About 5½ months old	14
VI	*Frost Damage.*—Hajipur forest—Karachi Division. Frost damaged babul—some quite dead—others recovering slowly	14
VII	*Road work.*—Local Dangi labour on road construction (Mahal Kalibel) in the Dangs ..	18
VIII	The Newman Tali Plantation of 1925 ..	18
IX	Another view of the Masonry Causeway over the Bawlazaru Nallah in Kanara Northern Division.	24
X	A reversing station on the Improvement No. 18 of Karanjali-Harsul Road in the West Nasik Division. Cost Rs. 399-4-0	29
XI	A dry Rubble Retaining Wall for the reversing station on the improvement No. 18 on Karanjali-Harsul road section. Cost Rs. 400 ..	30

List of trees and shrubs mentioned in the Report and their Scientific names.

English and Vernacular names.	Scientific name.
Ain, matti	*Terminalia tomentosa.*
Anjan	*Hardwickia binata.*
Babul	*Acacia arabica.*
Bahan	*Populus euphratica.*
Bamboo	*Dendrocalamus strictus.*
Ber	*Zizyphus Jujuba.*
Blackwood, Shisum ..	*Dalbergia latifolia.*
Dindal, Dhavda	*Anogeissus latifolia.*
Dhamni	*Grewia tiliæfolia.*
Eucalyptus	*Eucalyptus globulus.*
Heddi	*Adina cordifolia.*
Hirda	*Terminalia Chebula.*
Honne	*Pterocarpus Marsupium.*
Jamba	*Xylia xylocarpa.*
Kandi	*Prosopis specigera.*
Kashid	*Cassia siamea.*
Khair	*Acacia Catechu.*
Kharsing	*Stereospermum xylocarpum.*
Lantana	*Lantana Camara.*
Nana	*Lagerstrœmia microcarpa.*
Nim	*Melia Azadirachta.*
Palas	*Butea frondosa.*
Rosha	*Andropogon Martinii.*
Safed Musali	*Chlorophytum tuberosum.*
Sandal	*Santalum album.*
Shigekai	*Acacia concinna.*
Shivan, Shivni	*Gmelina arborea.*
Simul, Sawar	*Bombax malabaricum.*
Tali	*Dalbergia sissoo.*
Teak	*Tectona grandis.*
Tiwas, Karimuttal.. ..	*Ougeinia Dalbergioides.*

FOREST ADMINISTRATION REPORT OF THE BOMBAY PRESIDENCY INCLUDING SIND FOR THE YEAR 1930-31

CHAPTER I.

1. ALTERATION IN AREA. (Forms Nos. 51 to 51D.)

The changes in forest area were as follows :—

Class of forest	Area on 1st April 1930	Added during the year	Excluded during the year	Area on 31st March 1931
	Sq. miles	Sq. miles	Sq. miles	Sq. miles
Reserved	13,722	451	456	13,717
Protected	1,182	91	113	1,160
Total ..	14,904	542	569	14,877

The areas added and excluded comprise :—

	Square miles. Gain.	Loss.
Afforestations against and disforestments in favour of cultivation	..	19
Alluvial accretions and erosions in Sind	12	20
Transfer from Reserved Forest to Protected Forest ..	9	9
Transfer from Protected Forest to Reserved Forest ..	22	22
Transfer from one Division to another in the Southern Circle	499	499
	542	569

Net loss 27 square miles.

There was a net decrease of 27 square miles in the total area of the Presidency owing chiefly (1) to disforestment of large areas, viz. 16 square miles in the Central Circle and 2 square miles in the Northern and Southern Circles, for purposes of cultivation and (2) to heavy erosions resulting in a loss of 8 square miles in the Sind Circle. An area of about one square mile was disforested for transfer to the Archæological Department for the excavations at Mohan-Jo-Daro in the Bagi forest of Larkana Division in the Sind Circle as per Government Resolution, Revenue Department, No. 9102/24, dated the 7th July 1930.

The Forest area in charge of the Forest and Revenue Departments stood as follows :—

	On 1st April 1930			On 31st March 1931		
	Reserved	Protected	Total	Reserved	Protected	Total
	Sq. miles	Sq. miles	Sq. miles	Sq. miles	Sq. miles	Sq. miles
In charge of the Forest Department.	11,769	562	12,321	12,003	530	12,533
In charge of the Revenue Department.	1,953	630	2,583	1,714	630	2,344
Total ..	13,722	1,182	14,904	13,717	1,160	14,877

The Kanara Coast Division in the Southern Circle, which was under the control of the Collector of Kanara, was abolished and its area (234 square miles) was added to the Kanara Southern Division under the control of the Conservator of Forests, Southern Circle, with effect from 1st November 1930. This transfer of control has resulted in (1) the creation of a new Bhatkal Range in Kanara Southern Division, (2) the transfer of the existing Siddapur Range from the Kanara Southern Division to Kanara Eastern Division. The variations in the figures of area in charge of the Forest and Revenue Departments are therefore mostly due to the abovementioned territorial changes.

The Forest area in the various Circles at the end of the year was :—

	Square miles.
Northern Circle	3,803
Central Circle	5,312
Southern Circle	4,624
Sind Circle	1,138

2. Forest Settlements.

The settlement of areas aggregating 50 square miles (60 square miles *minus* 10 square miles which were eroded before settlement), chiefly in the Northern, Central and Sind Circles, was in progress at the beginning of the year and additional areas aggregating 28 square miles chiefly in the Sind Circle were taken in hand during the year. The settlement of 3½ square miles, chiefly in Sind, was completed and 16½ square miles remained to be settled at the close of the year.

The settlement of the forest area (1,713 acres) in the Kolaba Division still awaits the outcome of the Civil Court proceedings taken by Sardar Biwalkar.

3. Demarcation.

Twenty-eight miles of new boundary line were artificially demarcated during the year in all the four Circles of the Presidency at a cost of Rs. 232. Forty-five miles remain to be demarcated in the Southern Circle. The existing boundary lines in all Circles were maintained in a state of repair at a cost of Rs. 3,357, forest subordinates having done a large part of this work as usual.

No progress was made in regard to the clearing of the 50 feet wide boundary line between the Dangs and the Baroda State. The trees for felling marked on the line last year (6 miles) were put up for sale but were not sold, there being no demand for them.

4. Forest Surveys.

Topographical survey work in the Kanara, Dharwar and Bijapur Districts in the Southern Circle was commenced during the year by No. 7 Party, Survey of India. No survey work was done in the remaining Circles. The area remaining to be surveyed is 13 square miles in the Northern Circle, 276 square miles in the Southern Circle and 909 square miles in the Sind Circle.

The expenditure incurred on constitution of State Forests was as follows :—

	1930-31	*1929-30*
	Rs.	Rs.
Northern Circle	1,231	2,335
Central Circle	..	..
Southern Circle	..	26
Sind Circle	78	90

CHAPTER II.

MANAGEMENT OF STATE FORESTS.

1. Regulation of Management.

(*a*) *Preparation and Control of Regular Working Plans.*

Preparation (*Form No. 55*).—The work of preparation and revision of Working Plans was carried out by the various Working Plan Officers controlled by their respective Conservators and the Chief Conservator. The work done is summarised below.

The following Working Plans received the sanction of Government during the year :—

(1) Working Plan for the Umarpata Reserves in West Khandesh Division (Revision),

(2) Working Plan for the Taloda Reserves in North Khandesh Division (Revision), and

(3) Honavar Tali Working Plan (Revision).

Work in connection with the following Working Plans was continued :—

(1) Nasik Scrub and Teak Pole Jungles, East and West Nasik Divisions (Revision),

(2) Scrub Jungle and Jamner Teak Pole Area in East Khandesh Division (Revision) ; (this plan was submitted to Government and sanctioned after the close of the year),

(3) Soppinhosalli High Forest Working Plan (Revision), and

(4) Working Plan for Series XI, Nagzhari Slopes (Revision).

The collection of data for altering the rotation of certain felling series of the Revised Thana Working Plan was in progress during the year and the final proposals are expected to be ready shortly.

The Gurcharan Officer has drawn up a felling scheme for the protected forests in charge of the Forest Department and for the "Nominal Reserves" in the Thana District. The scheme is being scrutinized.

Figures of exploitation (outturn prescriptions) of sandalwood in the Belgaum Division were revised under sanction from the Chief Conservator.

The Conservator of Forests, Sind Circle, remarks that a revision of the Hyderabad and Karachi Division Plans is urgently required owing to considerable alterations in area due to erosion and accretion as well as to the confusion caused by the minute sub-division of compartments. This work will be taken in hand as soon as an officer becomes available for it.

There was a net addition of 7 square miles to the area under Working Plans during the year, which now amounts to 8,871 square miles out of a total of 9,408 square miles for which Working Plans are considered to be necessary. New plans are under preparation for 265 square miles out of 537 square miles for which plans are still required. In addition to this, old plans are under revision for an area aggregating 1,084 square miles.

(*b*) *Control of Working Plans.* (Form No. 55A.)

Continued general trade depression with the consequent slump in the market, and the Civil Disobedience Movement, were mainly responsible for arrears of fellings in the Northern, Southern and Central Circles. Owing to lack of demand on account of the poor quality of the stand, some coupes found no purchasers in the Central Circle. Work in the Southern Circle remained in arrears in certain cases due to scarcity of labour and the difficulty of obtaining contractors to work at reasonable rates. In the Hyderabad and Karachi Divisions of the Sind Circle the usual annual sale of coupes was postponed as a large quantity of dead-wood available in the areas affected by frost in 1929-30 was exploited and sold instead.

A view of the Masonry Causeway over the Bawlazaru Nallah in Kanara Northern Division.

G P Z P 1932

2. Communications and Buildings.

(*a*) *Roads and Bridges.*

Construction work was in progress on 100 miles of new roads and repairs were carried out on 1,452 miles of old roads. The expenditure on new works and repairs was respectively Rs. 1,34,463 and Rs. 93,759 as against Rs. 1,50,625 and Rs. 1,19,209 in the previous year. For want of adequate provision of funds, only the most important roads were kept in repair. The amount charged to repairs includes maintenance charges on the Alnavar-Dandeli Railway, viz. Rs. 43,835 against Rs. 45,766 in the previous year. The annual contribution of Rs. 25,000 to the District Local Board, Kanara, ceased to be paid from the forest budget grants from the current year, the contribution being met from the funds under " 41-Civil Works."

The work of completing the Baroda section of the Subir-Nawapur road has been taken in hand by the Baroda Durbar and it is hoped that this section of the road, which provides a through metalled road from Nawapur to Laochali, will be available for traffic in the next working season.

The work of realigning portions of the proposed Ozar-Saiwan road in the Northern Circle with a view to avoiding Portuguese territory was started by the Forest Engineer during the year and will probably be completed next year.

Very satisfactory progress was made on the construction of the Dara-Dhadgaon road in the Central Circle which has now been rendered motorable from Dara to Dhadgaon in the Akrani.

(*b*) *Buildings.*

The total expenditure on buildings was Rs. 53,673 of which Rs. 23,303 were spent on new works and Rs. 30,370 on repairs. Corresponding figures for the previous year were Rs. 58,911 and Rs. 37,535. The expenditure on new works was for the most part incurred for quarters for subordinates. Progress on new works was much curtailed for want of sufficient provision of funds. The necessity for housing accommodation for the subordinates is very seriously felt in all the Circles.

(*c*) *Miscellaneous.*

Rs. 3,375 were spent on new works and Rs. 9,522 on repairs, as against Rs. 7,509 and Rs. 12,804 in the previous year. The expenditure under this head is incurred chiefly on wells, fencing of compounds, telephone rent, charges for regular water supply paid to the Public Works Department and repairs to sluices and karias in Sind.

The improvement of water supply in the Dangs is a very urgent necessity both in the interest of the villagers and the forest establishment. Unfortunately the location of suitable sites for wells continues to be a difficult matter. The question of carrying out an underground water survey is under correspondence with the Director of Agriculture.

3. Protection of Forests. (Form No. 57.)

(*a*) *General Protection.*

The following statement compares the number of forest offences of the year with those of 1929-30 and the average of the last three years:—

Class of offence	1930-31					1929-30	Average of 1927-28 to 1929-30
	Northern Circle	Central Circle	Southern Circle	Sind Circle	Total		
I. Injury to forest by fire.	800	702	530	92	2,124	2,107	2,013
II. Unauthorised felling or removal of produce.	3,119	3,866	1,489	1,021	9,495	10,390	10,012
III. Unauthorised grazing.	1,827	2,485	532	1,538	6,382	6,384	6,557
IV. Other offences	603	1,344	212	134	2,293	2,649	2,304
Total for 1930-31 ..	6,349	8,397	2,763	2,785	20,294	..	..
Total of 1929-30 ..	7,001	8,632	3,026	2,871	..	21,530	..
Average of 1927-28 to 1929-30.	6,731	8,051	2,972	3,132	..	..	20,886

As compared with the previous year, there was a decrease of 1,236 in the total number of offences, all the four Circles contributing thereto. an increase of 17 under Class I, and a decrease of 895, 2 and 356 under Classes II, III and IV.

Injury by fire.—On the whole there was an increase of 17 in the total number of offences under this head, as compared with the previous year. Northern and Sind Circles show a decrease of 103 and 16, while Central and Southern Circles show an increase of 85 and 51. Causes of forest fires are discussed under " Protection from fire ".

Unauthorised fellings.—There was on the whole a decrease in all Circles, as compared with the previous year, though increases have been recorded in some Divisions, viz. Surat and West Thana in the Northern Circle and East and North Khandesh, Satara and Kolaba Divisions in the Central Circle. The decrease is chiefly noticeable in the North Thana Division where the number of offences dropped from 814 in 1929-30 to 363 in 1930-31. The work of the forest subordinate staff is nowadays

concentrated on regeneration areas, thinnings, coupes, etc., and subordinates find little time for general patrol of open forests with the result that many of the offences actually committed go unreported. Particularly this year efforts of the staff were chiefly confined to the combating of the Civil Disobedience Movement and to the prevention of organized looting on a large scale. Owing to the non-co-operation of the villagers, detection of offences became increasingly difficult this year.

Unauthorised grazing.—The total number of offences committed under this head is almost the same as last year. Deliberate grazing of cattle in closed areas was resorted to by some villagers in the Northern and Central Circles in pursuance of the non-cooperation cult. A large number of cattle of professional graziers resorted to forests for grazing in the Sind Circle, resulting in some increase in illicit grazing.

Other offences.—On the whole there was a decrease in the total number of offences under this head though the Northern and Sind Circles show an increase of 87 and 3 as compared with the previous year. The increase in the Northern Circle is mainly due to the fact that cases of breach of the transit rules are now classed under this head instead of under unauthorised fellings. The Sind Circle attributes the small increase to offences under game and transit rules.

Six hundred and twenty-six new cases were taken into Court during the year. 554 cases including 167 cases pending from the previous year were decided and of these 514 or 93 per cent. resulted in convictions. 15,536 cases were compounded and compensation amounting to Rs. 1,18,287 was recovered in 14,949 cases, the average per case being Rs. 7·9 as compared with Rs. 8·9 in the previous year. Offenders in 587 cases were let off with a warning and in 3,881 or 17 per cent. of the new and pending cases the offenders were not detected.

In Sind Circle there were 9 cases under various sections of the Indian Penal Code taken to Court, 7 by the Forest Department and 2 by private individuals. Of the 7 prosecutions launched by the Forest Department, one concerned a forest guard who, having absconded with Government records, articles of uniform and a privately owned pony, was convicted and sentenced to imprisonment and fine; one related to a *bania* of Hyderabad who, for issuing a transit pass under a forged signature, was awarded six months' rigorous imprisonment; and the remaining five were of assault on forest subordinates while in discharge of their duties. Convictions were secured in all the four cases disposed of during the year.

The two cases, in which complaints were lodged by private individuals, concerned forest guards, both accused being convicted by the trying magistrate. One of them appealed against the sentence passed and was honourably acquitted by the Sessions Judge.

(*b*) *Protection from fire.*

The figures in the subjoined statement compare the result of the two fire seasons, 1st June 1929 to 31st May 1930 and 1st June 1930 to 31st

May 1931. These figures do not tally with those in Appendix 58 which are for the financial year, viz., 1st April 1930 to 31st March 1931 :—

Circle	Fire season of	Area attempted to be protected	Failures	Area actually protected	Percentage of area actually protected	Cost	Cost per square mile protected
		Sq. mile	Sq. mile	Sq. mile		Rs.	Rs.
Northern ..	1930-31 ..	3,318	143	3,175	95	19,272	6·1
	1929-30 ..	3,318	139	3,179	96	19,625	6·2
Central ..	1930-31 ..	3,830	351	3,479	91	9,346	2·7
	1929-30 ..	3,842	322	3,520	92	8,916	2·5
Southern ..	1930-31 ..	1,567	69	1,498	90	7,472	5·0
	1929-30 ..	1,606	89	1,517	94	7,387	4·6
Sind ..	1930-31 ..	500	4	496	99	261	0·5
	1929-30 ..	493	2	491	99	344	0·7
Total ..	1930-31 ..	9,215	567	8,648	94	36,351	4·2
	1929-30 ...	9,259	552	8,707	94	36,272	4·2

Compared with figures for the past year there has been on the whole an increase of 15 square miles in the area burnt during the year. Northern, Central and Sind Circles show respectively an increase of 4, 29 and 2 square miles, while the Southern Circle shows a decrease of 20 square miles.

The increase in the Northern Circle is due to the occurrence of fires in the later part of the season chiefly in the Surat Division and to a lesser extent in the Panch Mahals Division. Despite warnings issued to the villagers for bad fire protection in the Mandvi Range (Surat Division) during 1929-30, extensive fires occurred again during the current fire season. The fires in this Range are reported to have been started deliberately by the villagers owing to their generally hostile attitude towards forest subordinates, an attitude which was accentuated by the agitation carried on by some mischief mongers among the local congress members. Cases in which offenders were traced were taken to Court and punitive measures are being taken to stop a recurrence of these intentional fires. The increase in the Panch Mahals Division is attributed partly to some fires which originated in the Baria, Jhabwa and Khushalgad States having crossed the exterior boundaries and entered the adjoining British forests and partly to the hostile attitude of the people in the Halol Range.

The proposal to close burnt areas to grazing for one year in villages in which fire protection is bad, referred to in last year's report, has now been approved by the Collector of Thana as well. This measure will be introduced after due warning, wherever the circumstances of the case

demand its adoption and it is hoped that it will tend to discourage incendiarism which has for its object the production of early green grass.

In the Central Circle the increase is shared by the North and West Khandesh Divisions. In the latter Division the area burnt this year was about double the area burnt in the previous year. The Divisional Forest Officer is of opinion that the increase is due to the stoppage of communal punishment, the villagers being as a rule privilege holders released from liability to punishment as a community for bad and persistent firing of their forests. Many of the fires were deliberately started simultaneously at different places with the result that it was quite impossible to trace individual offenders.

It is a matter of much regret that while engaged in fighting a forest fire in Takia forest of the West Khandesh Division two persons were accidentally burnt to death and six persons sustained injuries. Government have sanctioned a grant of compensation of Rs. 150 to the nearest relatives of the deceased, and Rs. 75 and Rs. 25 each to two and four injured persons respectively.

In the Southern Circle there were 530 cases of forest fires this year as against 479 in 1929-30. Of these one was taken to Court, 12 were compounded and 517 remained undetected. In the one case taken to Court the offenders were acquitted for want of sufficient evidence. In spite of the increase in the number of fires the Circle had on the whole a successful year for fire protection. A larger number of fires occurred in the less important forests of Bijapur and the Kanara Coastal area, and for these fires, lack of discipline brought about by the Civil Disobedience Movement is mainly to be blamed. Protection in the more important teak and sandalwood forests was distinctly better than in the previous year. Favourable conditions of the season were to some extent responsible for this, as, in most of the High Forest areas, thunderstorms from March onwards rendered the forest much less inflammable than in the previous year. Increased efforts made by the local staff and a slight increase of expenditure on protective measures also contributed to greater success in protection of valuable areas. Kanara Eastern Division, however, suffered greatly as several intentional fires were started in March at the time of the Holi Festival in Blocks II and X. Another serious fire also occurred in the valuable Wadehukli teak plantation of the same Division and caused considerable damage. This latter fire is reported to be intentional as it was started in several different places, all within the planted area.

Rewards in the shape of turbans and silver bangles of an aggregate value of Rs. 551 were distributed among Patils and others in the Surat Division for conspicuous help in fire and general protection in the Dangs. In the Central Circle money rewards were paid to those who rendered help in extinguishing fires and grazing fees were remitted in cases of good fire protection. In the Southern Circle 47 villages were rewarded with free or concession grazing. A number of persons in Dharwar and Bijapur

also were rewarded with remission of grazing fees for the timely help rendered by them to the Department. Remission of grazing fees was granted in the case of 200 cattle owned by two charitable institutions in the Badami Range, Bijapur District.

The following table compares the number and origin of fires for the two financial years 1929-30 and 1930-31 (*vide* Form No. 59) :—

Origin	Number of fires		Area burnt in acres	
	1930-31	1929-30	1930-31	1929-30
A—Originated in departmental fire conservancy operations.	37	48	3,184	64,291
B—Crossing exterior fire lines	202	149	45,966	26,275
C—Accidental (persons in forest).	473	544	46,904	86,961
D—Intentional (persons in forest).	123	100	28,330	53,429
E—Railway engines ..	15	23	1,147	950
F—Lightning ..	15	1	911	1
G—Causes unknown ..	1,314	1,257	224,651	155,275
Total ..	2,179	2,122	351,093	387,182

(c) *Protection from cattle.* (Forms Nos. 60 and 61.)

The forest areas open and closed to grazing were as follows :—

	Square miles	Per cent.
Closed to all animals for the whole year ..	1,456	9·79
Closed to all animals for part of the year ..	308	2·07
Open to all animals except browsers for the whole year	9,636	64·77
Open to all animals except browsers for part of the year	19	0·13
Open to all animals for the whole year ..	3,458	23·24
Total ..	14,877	..

The reduction in the period of closure in Thana forests from 10 to 5 years was continued except in cases where the growth was retarded by fires. In the case of Teak timber and Pole areas of the North Khandesh Division the Chief Conservator, after personal inspection, ordered the reduction in the period of closure from 15 years to 5 years except where closure for a longer period is essential on account of demand for grass.

The period of closure in the Teak Pole areas of Dharwar-Kalghatgi and Hangal-Bankapur Working Plan and Dharwar-Kod Scrub forests Working Plan was reduced from 10 to 5 years with the approval of the Collector of Dharwar and sanction from the Chief Conservator, with a view to affording more grazing facilities to the villagers.

As almost 90 per cent. of the Presidency forests are open to grazing of horned cattle throughout the year there can be little or no ground for complaint.

The number of cattle admitted to grazing was as under :—

Circle	Horned cattle		Sheep and goats		Camels
	1930-31	1929-30	1930-31	1929-30	1930-31
Northern ..	705,456	673,951	86,840	116,373	..
Central ..	670,207	835,018	221,598	271,891	..
Southern ..	309,055	404,744	74,551	73,297	..
Sind ..	33,452	30,237	36,615	30,335	2,096
Total ..	1,718,170	1,943,950	419,604	491,896	2,096

Circle	Camels—*contd.*	Other animals		Total	
	1929-30	1930-31	1929-30	1930-31	1929-30
Northern ..	..	843	1,240	793,139	791,564
Central ..	..	6,474	9,375	898,279	1,116,284
Southern ..	..	176	447	383,782	478,488
Sind ..	1,419	4,042	2,633	76,205	64,624
Total ..	1,419	11,535	13,695	2,151,405	2,450,960

There is a decrease in the number of cattle grazed in the Central and Southern Circles. A smaller number of outside and non-village cattle came to graze in the forests of East, West and North Khandesh Divisions owing to good rains and consequent abundance of fodder in malki lands. The number of cattle that sought admission to kurans and closed sub-blocks on payment of closed forest grazing fees was very much less in the Central Circle than in the previous year. The decrease in the Southern Circle was partly due to cattle disease and partly to all calves under 18 months being now exempt from fee and therefore not taken into account in the above statement. Though the above causes were responsible for a part of the total fall in numbers, there seems to be little doubt that the remainder did actually graze in forest though owing

to the Civil Disobedience Movement, no grazing passes were taken out for them and they had therefore to be left out of account.

The number of cattle impounded for unauthorized grazing in open and closed forests is given in the following table :-

Circle	Horned cattle		Sheep and goats		Other animals		Total		Total of open and closed	
	Open	Closed	Open	Closed	Open	Closed	Open	Closed	1930-31	1929-30
Northern ..	2,851	22,991	10,519	2,003	21	244	13,391	26,138	39,529	30,66
Central ..	10,736	34,707	3,300	6,370	503	401	14,539	41,478	56,017	61,90
Southern ..	553	3,895	3,556	2,047	..	..	4,109	6,842	10,951	10,453
Sind ..	1,637	1,410	675	2,504	116	500	2,428	4,414	6,842	6,18
Total ..	15,777	63,003	18,050	14,724	640	1,145	34,467	78,872	113,339	109,18
Average of 3 years from 1927-28 to 1929-30.	9,300	60,420	22,520	19,430	222	915	32,042	80,765	112,807	

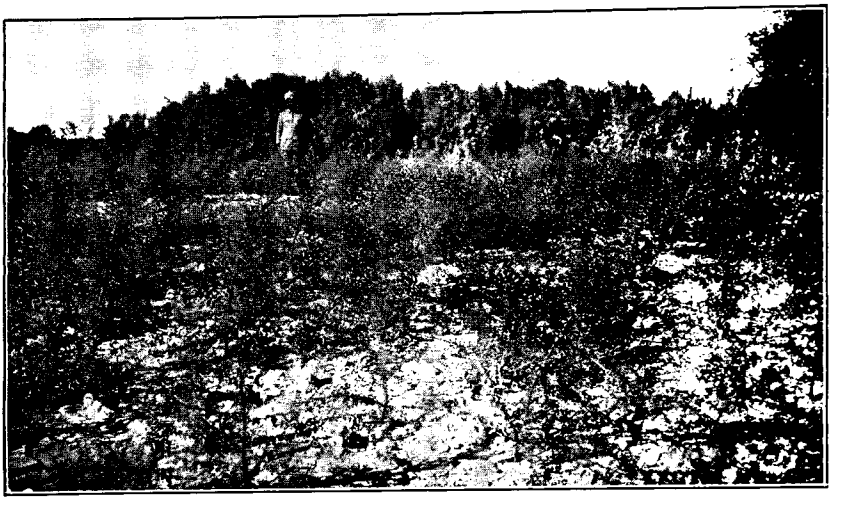
On the whole the total number of impoundings shows an increase which is shared by the Northern, Southern and Sind Circles. The increase in the former two Circles is partly due to the "no-tax campaign" of the Civil Disobedience Movement, in pursuance of which villagers in some parts deliberately grazed large herds of cattle without payment of grazing fees, or in closed areas, and partly to prolonged drought in the Bijapur District and in a part of the Dharwar District.

The reasons given for the increase in the Sind Circle are (1) that owners of cattle desire to pay pound fees in preference to grazing fees and fine, the former being less than the latter, and (2) that the Kot-Sultan and Garhiyasin forests, which were hitherto always waterless, came under the influence of floods this year, and gave a luxuriant crop of grass which was responsible for straying of the cattle of the neighbouring villages into these areas. The Conservator of Forests, Sind Circle, reports that he has brought to the notice of the Commissioner in Sind the fact that grazing fees and fines are higher than the pound fees in Sind and has suggested to him the necessity for increasing the pound fees. The matter is under consideration of the Commissioner.

The decrease in the Central Circle is attributed to the fact that during the Civil Disobedience Movement, it was impossible to impound large herds of cattle deliberately taken to graze in the forests.

(*d*) *Protection against injuries from natural causes.*

Vegetable pests.—Cutting or uprooting of climbers, lantana, loranthus, etc., was carried out through the medium of forest contractors and subordinates and in some parts by employing paid labour.



ARTIFICIAL REGENERATION IN RIVERAIN AREAS.
Babul in Budhka Forest—Karachi Division—$5\frac{1}{2}$ months old. 3′—0″ high.

G. P. Z. P. 1932

EROSION.
Ghotano forest—Halla Range—Hyderabad Division.

Wind storms, frosts and floods.—An area of approximately 1½ acres was washed away by erosion in the casuarina plantation at Akshi and Nagaon in the Kolaba Division. In the Sind Circle the inundation of the year was high which resulted in damage to young babul plantations in the Larkana Division. Newly regenerated areas in the Shikarpur Division suffered heavily from frost.

Animal pests.—Elephants, bison, sambhar, monkeys, hares, porcupine, wild pigs and rats were as usual responsible for a certain amount of damage in plantations and teak pole areas. "Chinkara" and the four horned antelope are reported to have caused considerable damage to *shiwan* (Gmelina arborea) plantations in the Panch Mahals Division.

Insect pests.—Teak defoliation was rather heavy in Kanara Northern Division and Southern Division and crickets also did considerable damage in Kanara Southern Division. No special damage is recorded elsewhere.

Erosions in Sind.—An area of 20 square miles was eroded during the year. A sum of Rs. 20,988 was realised by sale of material exploited from eroded areas. 2,704 acres were exploited in anticipation of erosion and the resulting material was sold for Rs. 27,586.

CHAPTER III.

SILVICULTURE.

1. Afforestation and Regeneration of Forests.

(*i*) *General progress of areas under regeneration.*

The progress of areas under regeneration was generally satisfactory. In the Northern Circle in the Mandvi Range, Surat Division, deliberate incendiarism caused considerable damage to young plantations, while in parts of the Thana District artificial regeneration of species not suited to the existing soil conditions gave poor results, elsewhere in this district results were moderate. Care is being taken in future to see that only suitable species are selected for use in the different types of soil encountered.

The experiment of clearing a 5′ line around each patch in old regeneration areas was continued in the North Thana Division and the result has been that the artificial reproduction of the last few years has in the great percentage of instances, been saved from damage by fire. A valuable, sound and healthy final crop is thereby assured.

Similar experiments which were tried in the West Thana and Panch Mahals Divisions proved to be effective in protecting young plantations from fire and the practice will be generally extended throughout the Circle.

In the Central Circle both natural and artificial regeneration suffered only where the non-cooperation movement was intense.

In the Southern Circle fire was responsibe for considerable damage in teak plantations. In Kanara Northern Division the Bhagwati 1928 and

1929 plantations were accidentally burnt early in the year necessitating the cutting back of about 10,000 plants in the older area. In Kanara Eastern Division the Wadehukli plantation suffered a serious set back at the end of the fire season. The most promising plantations in this division are those at Ganeshgudi, Nersol, Mundwad, Mundgod, Katur and Kirwatti where the necessity for retaining or introducing an admixture of junglewoods has been realised and active measures are being taken to improve the composition of these plantations both by natural and artificial means. In Kanara Southern Division the results obtained at Sunksal, Arbail, Hulegar, Hasrawalli and Hudli were an unqualified success, while at Lakkeguli and Kochodi through very severe porcupine attack the plantations were almost complete failures. A noteworthy feature of the year's work in this connection was that the areas taken in hand departmentally were almost invariably more successfully planted up than the areas regenerated with the help of *kumriwallas*, and the Conservator of Forests, Southern Circle, hopes that it will soon be possible to dispense with this agency of regenerating the forests.

In Belgaum wild animals caused somewhat serious damage in the Nagargali plantations.

In the Sind Circle the inundation of the year was high and satisfactory, in that while all the riverain forests were submerged many of the inland forests received water with beneficial results. Pre-inundation sowings were mostly swamped but post-inundation sowings gave satisfactory results. The area flooded was 571,500 acres compared with 630,637 last year and 209,581 acres the year before.

(*ii*) *Establishment of Reproduction under Working Plans or Schemes.*

(*a*) *Mainly natural.*

Reproduction by coppice was on the whole satisfactory everywhere, particularly in the West Khandesh and Kolaba Dvisions where it was remarkably good. In the Panch Mahals Division it is observed that a large percentage of stumps fails to coppice necessitating the adoption of artificial means for restocking exploited areas, while in the East Nasik, and the above-ghat portion of the West Nasik divisions on account of adverse soil and climatic conditions coupled with damage wrought by fire, man and beast coppice reproduction is poor.

Seedling growth resulting from self sown seed succumbs in varying degree according to the adverse factors it has to contend with, such as unrestricted grazing in East Nasik; heavy growth of grass and weeds in the Panch Mahals, Surat, Thana and Kolaba; and unfavourable climatic and soil conditions in East Khandesh and Satara. In the latter division germination is usually unsatisfactory owing to the situation of the forests on steep slopes, where fallen seed rarely finds secure lodgment before it is washed away by the first heavy shower of rain which may fall.

This year appears to have been a bad seed year for teak in the Northern Circle.

ARTIFICIAL REGENERATION.
Babul in single furrows—Khirsar Forest—Karachi Division—About $5\frac{1}{2}$ months old.

FROST DAMAGE.
Hajipur Forest—Karachi Division. Frost damaged babul—some quite dead—others recovering slowly.

G P Z P. 1932

(b) Mainly artificial.

While the labour and talent spent on artificial regeneration may occasionally appear at first sight to have been wasted, when visible results are defective as judged by the percentage of success attained, more often than not a few failures teach more valuable lessons in silviculture and economics than dozens of passably successful plantations. This year has been productive of both good and bad results in all the Circles and a description of the work in each is given below.

Northern Circle.—Sowing and planting of teak, teak and *simul* and teak and mixed injaili species on burnt patches were attempted in all exploited coupes in practically all divisions, casualties being replaced by transplants or root and shoot cuttings. In the Panch Mahals, due to ignorance on the part of subordinates, stump-planting was not as successful as in other divisions. Wherever a good burn was secured, as in Thana, the original sowings or plantings were generally successful. In East Nasik pit sowing was adopted and gave tolerable results ; in West Nasik, in the above-ghat portion, attempts to supplement natural regeneration by artificial means were unsuccessful and have amply demonstrated that the soil there is both poor and shallow, while the underlying rock prevents the roots of tree growth from penetrating deep enough for ultimate survival. It is proposed hereafter to confine artificial regeneration measures to those places only in this tract, where the soil is fertile and of sufficient depth to permit of the adoption of strip sowing with species such as *babul, khair, dhavda,* etc.

Central Circle.—In all the divisions except East Khandesh artificial regeneration produced good results. " Stump " planting was resorted to for the first time in the Poona Division and proved extremely successful although the " stumps " were imported from Kolaba. In West Khandesh efforts in Umerpata and Deomogra have shown that whereas in the former forest, owing to attacks of wild pig and other causes, conditions are unfavourable to artificial regeneration of teak, in the latter there really is no need to supplement the natural seedling crop normally obtained. In Kolaba artificial reproduction of teak, bamboo, *simul, shivan, khair, hirda* and *ain* was carried out as vigorously as usual. 39 coupes were given out for temporary cultivation of hill crops. 872 families were engaged in the operation and the assistance rendered by these people in planting out nursery raised seedlings in among their crops and carrying out timely and necessary weedings has been so useful that there is a possibility of having all exploited areas, treated under this method of agri-cum-forestry, uniformly planted up throughout the length and breadth of the coupe. Hitherto the only people who were interested in hill-crop cultivation in exploited coupes were the *Thakurs* and *Katkaries* but, of late, it is satisfactory to note, that even Marathas are coming forward in the Nagothna and Roha ranges to share the benefits offered.

The *babul* plantations in East Khandesh, under the agri-cum-forestry system, and those departmentally created in the Poona Division as well as the casuarina plantation in Kolaba showed satisfactory results.

In East Khandesh high floods in September 1930 damaged the *babul* crop in one coupe near Jamner. The tethering of sheep in exploited coupes in the Poona *babul* areas was instrumental in producing a profuse crop of seedlings. At Dapoli in the Kolaba Division in one coupe, instead of casuarina, teak and the more important junglewoods were raised, as there is a keen demand for the latter class of timber.

In the Satara Division besides raising junglewood species, sandal regeneration was attempted on a large scale with satisfactory results. Attempts at establishing Eucalyptus in the Mahableshwar forests are being continued.

Southern Circle.—Nearly 2,500 acres after clear felling were taken up for concentrated regeneration with teak. Natural teak and junglewood seedlings were carefully conserved to supplement the stocking. In Kanara Northern Division *karimuttal* (Ougeinia Dalbergioides) was successfully raised with teak over an area of about 20 acres by the adoption of the quincunx method of planting. In Kanara Eastern Division teak was planted out in various parts of mature forest either on the sites of burnt bamboo clumps or in places where improvement fellings had left sufficient brushwood to burn and form a suitable seed-bed.

An unfavourable and somewhat fitful monsoon, with drying winds prevailing during dry spells, retarded the growth of plants and the germination of seed in parts of Kanara and Belgaum, while in the latter division elephants were responsible for much damage.

In the teak pole and mixed forest areas valuable work was done in the Halyal Range of Kanara Northern Division, Nagargali and Khanapur Ranges of Belgaum, and all the Ranges of the Dharwar-Bijapur Division. In Halyal excellent results were obtained with *matti*, *shivani*, *karimuttal*, *honne* and blackwood.

55 acres were successfully regenerated with casuarina in Kanara Southern and Western Divisions.

Sind Circle.—18,559 acres of exploited coupes, *kachas* and blanks were sown with 3,350 maunds of *babul*, *khandi* and *ber* with very satisfactory results. In the Hyderabad Division with a view to minimising the effect of frost, which is a very prolific source of damage to *babul* in Sind, seed was sown under branchwood stacked in lines 45 feet apart, as an alternative to the more usual method of burning all the "slash." The seedlings, it is noticed, though frequently growing crooked in the earliest stages, soon straightened out and, being effectively protected against frost and grazing, developed more vigorously.

(*c*) *Afforestation.*

No direct operations were undertaken under this head, but in the Sind Circle 11,137 acres were given out for temporary cultivation as a preliminary stage in the scheme for finally afforesting them in later years.

(iii) Plantations and other forms of regeneration not under Working Plans or Schemes. (Form No. 62B.)

Success attended the attempt made on a small scale to raise *simul* (Bombax malabaricum) in the Protected forests near Waghai in the Dangs. The upkeep of the casuarina plantation in North Thana cost Rs. 365. No thinnings were carried out but deadwood and windfalls were sold and realised Rs. 253. The *simul* plantation in East Thana was weeded at a cost of Rs. 50. In East Nasik 19,500 pits were sown with *anjan, khair*, teak, *dhawda* and *ain* ; germination was satisfactory but the number of seedlings surviving is small, viz. 1,459 owing to unfavourable local factors. Taking advantage of the demand for land for cultivation in West Khandesh, 10 plots aggregating 100 acres were given out in the Nandurbar Range for treatment under the agri-cum-forestry system. The results are so satisfactory that it is proposed to give out 10 more plots next year. No additional plots were given out in the Dhulia Range.

In the Poona Division all agri-cum-forestry plots show satisfactory progress. In the Poona and Ghoda Ranges about 78 acres have been given out for eradication of lantana the uprooting of which is in progress. The sowing of *kashid* (Cassia siamea) simultaneously with sandal on ploughed ridges was attempted in the Satara Division. In spite of the set-back experienced from defiant grazing of cattle, one of the forms of activity of the non-co-operation movement, there is every reason to believe that *kashid* is likely to prove a suitable host for sandal.

Southern Circle.—In Kanara Northern Division an area of 5 acres was planted up with teak on burnt patches in S V-25 of Dandeli Range worked under Improvement fellings. The growth not being very satisfactory, all the plants were cut back in May 1931 and the shoots now produced seem promising.

An area of 23 acres was added to the Nagzhari plantation in S XI-24. In this case the espacement is $12' \times 9'$ and the teak is largely supplemented by natural regeneration of junglewoods, particularly *jamba* and blackwood, from root shoots. The results obtained are satisfactory.

In Kanara Eastern Division attempts to regenerate sandalwood under lantana bushes were continued in 7 villages of Sirsi and 1 village of Siddapur Range. Considerable success was obtained in 3 villages especially with the method of transplanting seedlings and the stock of young plants is being definitely increased.

In Kanara Southern Division advantage was taken of the clearances made by improvement fellings and of the "slash" left, to make "groups" by felling a few more trees of inferior species on the edges of existing clearances. The debris was burnt, and the groups planted up with teak stumps. The results obtained were encouraging.

In the Belgaum Division sandalwood sowings were carried out in 11 coupes of the Gujnal Range. Patches in about 30 acres of these coupes

were also broadcasted with sandal seed under lantana clumps but germination was not successful. The pricking out of young sandal transplants from neighbouring malki lands was continued in the Patne Range. Attempts were also made to introduce *babul* and *nim* in charcoal kiln sites in the felled coupes of the Gujnal and Gokak Ranges. The seedlings grown on slopes near *nullahs* showed fair progress.

Sind Circle.—No further additions were made to the existing area of 540 acres of Dalbergia sissoo (*tali*) plantation nor was any of this area excluded during the year. The condition of trees 5 to 11 years old was quite good in the Newman Tali Plantation. The work of further thinnings, with a view to wider spacing, has been completed during the year dated throughout the Newman Tali Plantation. Sowing on trenches the Shah-Makai forest was extended by about a quarter of an acre during the year.

Sowing operations were continued in *kachas*, blanks, erosion strips and in areas under cultivation.

Throughout the Presidency Rs. 8,740 were spent on regeneration work outside the Working Plan areas and 15,774 acres with 1,045 groups were completely regenerated. Corresponding figures for last year were Rs. 11,937 and 12,413 acres.

(*iv*) *Tending.*

In all plantations, weeding, cleaning, mulching, thinning, cutting back malformed stems and straggling bushy plants, climbers and bamboos, and stubbing of grass were carried out wherever necessary.

(*v*) *General.*

A general survey of the operations connected with the regeneration of forests shows satisfactory progress in all directions. A marked feature of the technique of artificially reproducing teak is the success which attends the use of " stumps " for planting out. The method is likely to be found suitable for universal adoption.

During the year in the Southern Circle a further advance was made in the right direction in so far as teak regeneration is concerned in that hereafter areas within a regeneration area proper, which may be found unsuitable for teak, will be exempted from clear felling and excluded from the regeneration programme.

The question of providing adequate funds for artificial regeneration is becoming acute and necessitates the closest attention especially in view of the large area already under plantation and being added to from year to year. Modifications of the clear felling system, which, while promising the utmost economy both now and in the future, will ensure improvement of stocking without bringing about radical changes in existing forest types, or involving undue interference with nature, are, as the Chief Conservator has been gratified to find in the course of his

ROAD WORK.
Local Dangi labour on road construction (Mahal Kalibel) in the Dangs.

G. P. Z. P. 1932

The Newman Tali plantation of 1925.

inspection tours, receiving the assiduous and intelligent study of all officers concerned.

2. Tending of the Growing Stock.

Improvement fellings.—The introduction of improvement fellings in the belowghaut forests of the West Nasik Division under the provisions of the revised Working Plan will benefit valuable advance growth which had hitherto been hampered by the reservation of too many useless, over-mature, fire-injured or otherwise defective teak and injaili trees.

In the Dangs, North Khandesh and West Khandesh divisions inferior trees, climbers, parasites etc. were cut ahead of regular improvement fellings, while those improvement fellings due to take place according to working plans were undertaken in all Circles of the Presidency proper wherever it was possible to secure purchasers for standing trees marked for felling.

Frost injured trees and malformed coppice were cut back in the Panch Mahals, while in East Khandesh silviculturally undesirable soft wood species and crooked trees were removed in the main fellings by contractors. In Poona all dead and fallen *babul* trees were collected departmentally and sold. Satisfactory progress was maintained by subordinates in eradicating prickly pear occurring in their charges.

Thinnings.—Thinnings were carried out in accordance with the prescriptions of the Working Plan in 102 coupes of the North Thana, 94 in the East Thana and 62 in the West Thana divisions. Teak standards over 42″ in girth were also marked and exploited along with the ordinary silvicultural thinnings from 173 of the above coupes (17, 94 and 62 coupes in North, East and West Thana divisions respectively). The produce from thinnings and standards so marked realised a net revenue of Rs. 99,421.

Thinnings were also carried out in the Mandvi and Bulsar-Chikhli Ranges of the Surat Division.

In the Central Circle thinnings in *babul* crops were carried out in East Khandesh and Poona, while in Kolaba 71 coupes in the teak working circles were thinned departmentally at a cost of Rs. 1,328 and the resultant material was sold for Rs. 770 ; 2 casuarina coupes were thinned and produced a gross revenue of Rs. 225.

Thinnings were carried out in the Kanara Northern, and Eastern Divisions, Belgaum and Dharwar-Bijapur divisions in the Southern Circle at a total cost of Rs. 1,419 and the sale of the resultant material brought in Rs. 3,109.

Thinnings, confined to the removal of suppressed dead and fallen stems, were carried out in Sind in all divisions except the Karachi division, where these operations had to be postponed owing to the necessity for collecting the large number of trees killed by frost.

Dead, dying and fallen trees taken out in the Shahpur, Adilpur and Kutta *tali* plantations in the Sukkur Division were sold for Rs. 72.

CHAPTER IV.

EXPLOITATION.

(*a*) System of Management.

(*i*) *Major Forest Produce.*—Form No. 55B (*vide* Volume II of this Report) shows the area in which various systems are in force.

Clear fellings.—Were carried out in the 3 Thana Divisions except Igatpuri Range, in the Panch Mahals Division (with limited reservation of a few valuable species), and in selected areas in all Ranges of the Dangs and Bulsar-Chikhli forests in the Northern Circle ; in Kolaba, Nawapur-Nandurbar forests and *Babul* forests in Poona and East Khandesh Divisions in the Central Circle ; in the teak pole forests of the Southern Circle generally, as also in areas selected for regeneration in the high forests of Kanara and Belgaum, the annual coupes of the revised Inland Coastal Plan in Kanara Southern Division, Fuel coupes and casuarina plantations in Kanara Western Division and throughout the Sind forests.

Coppice with standards.—Fellings of this nature took place in the forests of Igatpuri (East Thana Division) and those of East Nasik Division, above-ghaut forests of Nasik and Dindori Ranges (West Nasik Division) ; in the Satpuda forests, *anjan* areas of East Khandesh, teak forests of Poona and Satara Divisions and parts of Belgaum Division.

Improvement fellings.—Were carried out in the Mandvi forests and in selected areas in all Ranges in the Dangs, in some coupes of East and West Khandesh Divisions, Matheran and Mahableshwar forests and in the high forests of Kanara and Belgaum as prescribed by the Working Plans.

Selection fellings.—In the Dangs Protected Forests, Peint and adjoining belowghaut forests of Nasik and Dindori Ranges (West Nasik Division), in some *anjan* coupes of West Khandesh Division and in the Nagzhari valley and in certain high forest areas of Kanara and Belgaum. These fellings also comprise the exploitation of dead and dying sandal under regular Working Plans in the Southern Circle.

Simple coppice fellings.—Were carried out in the annual coupes of North Kanara Coastal Fuel Plan and in the scrub forests of the Dharwar-Bijapur Division.

Unregulated fellings.—These comprise fellings of dead and dying sandalwood elsewhere than in the Southern Circle, clearings for cultivation, deadwood fellings, fellings of matchwood species ; clearing of grazing grounds, felling of royalty trees in malki lands, and of trees for free grants, permits etc., and in Sind, cutting of dead and wind-fallen trees and clearance of erosion strips. They also included the exploitation of trees damaged by frost in the Panch Mahals Division.

(*ii*) *Minor Forest Produce.* (Form No. 64.)

As usual minor forest produce was mainly farmed out or sold on permit.

A quantity of 122 khandies of *hirda* was collected departmentally on the share system in the Poona Division. This quantity together with the last year's balance was sold for Rs. 10,218.

The lac collected departmentally two years ago in Sind was sold for Rs. 137. There was practically no lac in Sind forests during the year and no collection was made as the lac-bearing trees were severely damaged by the frost of 1929.

(*b*) Agency of Exploitation.

(*i*) *Departmental Agency.*

The following is a comparative statement of major and minor produce extracted departmentally during two years 1930-31 and 1929-30 :—

Circle	Year	Major Forest Produce			
		Timber C.ft. in thousands	Fuel C.ft. in thousands	Total C.ft. in thousands	Sandalwood value
					Rs.
Northern	1930-31 ..	496	419	915	237
	1929-30 ..	534	449	983	68
Central	1930-31 ..	5	544	599	778
	1929-30 ..	12	784	796	5,181
Southern	1930-31 ..	1,089	4	1,093	99,987
	1929-30 ..	856	10	866	1,67,155
Sind	1930-31 ..	4	203	207	....
	1929-30 ..	11	1,200	1,211	....
Total	1930-31 ..	1,594	1,170	2,764	1,01,002
	1929-30 ..	1,413	2,443	3,856	1,72,404
Difference		+181	−1,273	−1,092	−71,402
Percentage of total outturn from all sources.		27	3	6	97

Circle	Year	Minor Forest Produce			
		Bamboos value	Grass and grazing value	Other value	Total value
		Rs.	Rs.	Rs.	Rs.
Northern	1930-31 ..	39	....	49	88
	1929-30 ..	85	9,460	....	9,545
Central	1930-31 ..	14	....	10,219	10,233
	1929-30 ..	150	....	183	333
Southern	1930-31 ..	7	....	176	183
	1929-30 ..	38	....	199	237
Sind	1930-31 ..	....	....	141	141
	1929-30 ..	....	....	178	178
Total	1930-31 ..	60	....	10,585	10,645
	1929-30 ..	273	9,460	560	10,293
Difference		− 213	− 9,460	+10,025	+352
Percentage of total outturn from all sources.		....	....	5	·6

In the Northern Circle, the decrease under timber is due to the shifting of the saw mill from Chikhalda in South Dangs to Sundha in the Central Dangs, which entailed temporary stoppage of work pending installation of the mill at the latter place. There was also a temporary closure of the saw mill at Sundha during October 1930 for want of sufficient stock of mill pieces. The decrease under fuel is due to the fact that the fuel depôt at Trimbak was run through a contractor instead of by departmental agency. The increase under sandalwood is due to a greater number of trees being exploited in the East and West Nasik Divisions. The 9 year monopoly contract having ended in 1929-30, there are no receipts under grass and grazing.

In the Central Circle the decrease under timber is due to no coupes having been worked on the share system in the Poona Division on account of the Civil Disobedience Movement and to less material extracted in the cultural operations in North Khandesh Division. The decrease under fuel is due to diminution in the quantity of firewood cut for the Panchgani and Malcompeth fuel depôts, as there was sufficient stock of the previous year, and to no coupes having been thinned in the Poona Division. The decrease in the value of sandalwood is due to nonsale of trees in the Satara Division. The increase under minor forest produce is mainly due to the recovery during the year of the value of *hirda* collected and sold last year.

In the Southern Circle the increase in the outturn of timber is due to better work done by contractors in all Divisions of Kanara. Except in Kanara Northern Division, where fuel was extracted for the use of the Foden saw mill and a small quantity in the Belgaum Division from broken standards, etc., no fuel was extracted, and this fact accounts for the decrease under fuel. The slump in prices was more marked in the case of sandalwood than of ordinary forest produce. In spite of a definite increase in the quantity of scented sandal exploited this year, the revenue under this head, which was realised with some difficulty, shows a large decrease.

In the Sind Circle the decrease under timber is due to there being no demand for *babul* logs either by the Gun Carriage Factory, Jubbulpore, or Messrs. Gilder and Company, Bombay. The decrease under fuel is due to the slump in the fuel market, in consequence of which departmental extraction was curtailed. There was also less demand for the supply of seed, etc., which has resulted in the decrease under minor produce.

Timber Depôts.—The average prices realised at the annual depôt sales in the Northern and Southern Circles are compared in the following table :—

Northern Circle.

Kind of timber.	Average rate per Khandi of 12·50 C.ft.					
	Jharia and Waghai depôts (Chikhalda and Sundha mills).		Nasik depôt (Badgi mill).		Nasik depôt (Haste mill).	
	1930-31	1929-30	1930-31	1929-30	1930-31	1929-30
Teak.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Boards ..	19 14 9	28 9 3	19 11 7	44 8 6	18 10 11	36 7 4
Battens ..	13 0 4	14 10 4	....	16 2 4	10 6 8	14 7 3
Scantlings, etc. ..	20 5 0	26 1 8	23 5 11	27 8 7	23 12 2	26 2 0

Southern Circle.

Kind of timber	Average rate per khandi of 12·50 C.ft.			
	Dandeli aboveghat depôt		Kodibag depôt	
	1930-31	1929-30	1930-31	1929-30
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Teak	26 15 3	35 1 0	27 1 3	32 3 0
Matti	17 4 0	17 4 0	20 15 5	20 1 0
Nana	20 9 9	20 10 0	....	....
Honne	19 12 0	24 0 0	21 6 1	....
Sissum	19 0 6	18 13 0	25 10 10	23 1 0
Kharsing	....	....	....	....
Karimuttal	17 5 0	23 7 0	....	....
Heddi	12 8 0	16 4 0	....	....
Other junglewoods ..	15 0 6	12 15 0	....	....
Teak scantlings	31 1 11	31 8 2	....	....
Teak planks	39 12 5	37 11 1	....	....
Teak battens	20 12 3	25 7 3	....	....

Kind of timber	Average rate per khandi of 12·50 C.ft.			
	Hattikeri depôt		Kirwatti depôt	
	1930-31	1929-30	1930-31	1929-30
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Teak	23 4 9	34 8 0	18 0 0	25 2 0
Matti	19 4 3	22 5 0	7 2 4	13 1 0
Nana	....	....	6 8 0	11 13 0
Honne	16 9 6	22 12 0	9 0 9	15 0 0
Sissum	24 4 9	23 1 0	....	....
Kharsing	15 2 3	....	....	....
Karimuttal	....	....	12 12 0	23 13 0
Heddi	....	....	9 6 5	10 6 0
Other junglewoods ..	....	....	....	7 5 0
Teak scantlings	....	....	27 4 5	28 2 0
Teak planks	....	....	32 15 1	37 8 0
Teak battens	....	....	20 9 2	21 14 0

The prices obtained in both the Circles were very unsatifactory. The low rates are attributable to the depressed state of the timber market which was temporarily accentuated by the Civil Disobedience Movement.

The Nasik market is at present overstocked with material and cannot absorb the full outturn of even one mill. There is very little competition and the cost of railway transport prohibits export to distant markets.

It is therefore proposed to close down the saw mill at Haste at the end of October 1931 especially as it is anticipated the yield will sell just as well in the form of standing crops.

Firewood Depôts.—All fuel depôts in the Northern Circle including the one at Trimbak were worked by contractors. In the Central Circle the depôt at Matheran was worked departmentally, and those at Mahableshwar and Panchgani were run by contractors, the latter being supplied with a stipulated quantity of firewood annually at a fixed rate. All the firewood depôts in the Kanara District were worked by contract agency.

Mechanical extraction and transport of timber and Government saw mills are dealt with in Chapter IV-A.

Private saw mills.—The saw mill belonging to Mr. Sayad Nasrodin Hasansab at Hanmapur was shifted to Katur and turned out 9,589 sleepers and 1,789 C.ft. of sawn material as compared with 4,090 sleepers and 1,536 C.ft. of sawn material in the previous year.

Cart depôts.—There was only one cart depôt at Kirwatti in Kanara District, which was maintained for the transport of touring officers' kit and for departmental timber and road works. The account of the depôt showed a net loss of Rs. 180 as against that of Rs. 917 in the previous year. As, however, motor transport is now usually available for the transport of officers' kit, and as the depôt continued to show a small loss, it has been abolished from 1st April 1931.

Messrs. Howard Brothers' Timber Agency.—The account with this Firm to the end of the financial year is given below :—

Description of timber	Receipts	Disposals	Balance in stock	Sale proceeds
	C.ft.	C.ft.	C.ft.	£ s. d.
Teak	22,616	22,616	..	
Matti	11,419	11,419	..	
Blackwood or rosewood ..	t. c. q. lbs. 29 4 3 3	t. c. q. lbs. 29 4 3 3	..	13,507 2 6
	C.ft.	C.ft.		
Honne	76	76	..	

Description of timber	All charges on sales	Other charges—freight, prime charges, etc.	Net proceeds
	£ s. d.	£ s. d.	£ s. d.
Teak	2,099 9 5	6,820 17 8	4,586 15 5
Matti			
Blackwood or rosewood ..			
Honne			

G. P. Z. P. 1932 Another view of the Masonry Causeway over the Bawlazaru Nallah in Kanara Northern Division.

No shipments of any timber were made to this Firm during the year.

Efforts to open up a market for teak sawn wood in South Africa are still continued with Messrs. Rhodesian Timbers limited. During the year two trial consignments, one of 14 and the other of 19 tons, of teak sawn wood of various sizes were shipped to Lorenco Marques and Durban as required by the Firm. An order for supply of another consignment of 20 tons has been received from the Firm after close of the year and the question of taking it up is being considered. From the fact that the Firm are placing small orders at present for this material one after the other, it is believed that some market exists in South Africa for sawn teak of Kanara quality but the possibilities of developing real business are at present uncertain.

(*ii*) *Purchasers.*

The following table compares the outturn of major and minor produce removed by consumers and purchasers during the years 1930-31 and 1929-30 :—

Circle	Year	Major Forest Produce				
		Timber		Fuel		Sandal-wood value
		C.ft. in thou-sands	Value	C.ft. in thousands	Value	
			Rs.		Rs.	Rs.
Northern ..	1930-31..	1,835	9,03,626	5,603	21,346	..
	1929-30..	2,347	20,31,179	6,028	27,732	..
Central ..	1930-31..	463	1,66,184	2,818	68,570	2,615
	1929-30..	952	2,88,429	6,764	93,399	2,797
Southern ..	1930-31..	1,425	2,33,184	8,223	1,87,574	..
	1929-30..	1,325	5,83,846	8,069	2,58,419	..
Sind ..	1930-31..	110	57,763	12,102	2,97,420	..
	1929-30..	128	81,147	13,976	2,89,997	..
Total ..	1930-31..	3,833	13,60,757	28,746	5,74,910	2,615
	1929-30..	4,752	29,84,601	34,837	6,69,547	2,797
Difference ..		— 919	— 16,23,844	— 6,091	— 94,637	— 182

Circle	Year	Minor Forest Produce: Bamboos value	Grass and grazing value	Other minor produce value	Total value
		Rs.	Rs.	Rs.	Rs.
Northern	1930–31	55,651	1,12,906	32,448	2,01,005
	1929–30	67,933	1,44,142	50,351	2,62,426
Central	1930–31	13,989	4,11,269	42,957	4,68,215
	1929–30	15,252	5,71,248	69,456	6,55,956
Southern	1930–31	71,134	81,577	59,125	2,11,836
	1929–30	84,164	96,957	70,550	2,51,671
Sind	1930–31	....	41,132	18,070	59,202
	1929–30	....	37,039	21,187	58,226
Total	1930–31	1,40,774	6,46,884	1,52,600	9,40,258
	1929–30	1,67,349	8,49,386	2,11,544	12,28,279
Difference		— 26,575	— 2,02,502	— 58,944	— 2,88,021

The figures show an all round heavy drop in the outturn and value of forest produce. The fall under timber and fuel and their value is chiefly due to the depressed state of the timber market everywhere and to nonsale of a number of coupes in the Northern and Central Circles owing to the active hostility of the Civil Disobedience Movement. The coupes that were sold fetched low prices. In the Southern Circle last year's revenue was swollen by the very high prices obtained for coupes, and for regeneration and improvement fellings, particularly by the price of 1½ lakhs obtained for the Bhagvati regeneration coupe in Kanara Northern Division. The decrease in the receipts under grass and grazing is mainly due to the Civil Disobedience Movement, as, owing to the disturbed state temporarily caused by the movement during the grazing season, the number of outside cattle and cattle from nonforest villages brought to forest for grazing was considerably less than usual and there was also difficulty in recovering grazing fees and in disposing of grass kurans. The demand for bamboos and other minor produce was less than last

year owing to general trade depression, some of the less important farms in the Southern Circle remaining unsold. This accounts for the decrease under minor produce.

(*iii*) *Rights, Privileges and Free grants.*

The following is a comparative statement of the quantity and value of forest produce removed by right and privilege holders and free grantees during the years 1929-30 and 1930-31 :—

Circle	Agency	Major Forest Produce				Minor Forest Produce			
		Timber		Fuel		Bamboos value	Grass and grazing value	Other minor produce value	Total value
		C.ft. in thousands	Value	C.ft. in thousands	Value				
			Rs.		Rs.	Rs.	Rs.	Rs.	Rs.
Northern..	C	28	1,750	4,609	1,04,737	5,038	4,32,981	8,760	4,46,779
	F	11	7,779	2	70	81	312	229	692
Central ..	C	..	..	528	21,222	..	53,871	11,250	65,121
	F	28	15,112	34	2,644	1,333	2,635	1,956	5,924
Southern..	C	300	72,000	3,000	37,500	45,000	2,84,339	20,000	3,49,339
	F	45	7,124	37	518	433	3,252	419	4,104
Sind ..	C	..	..	10	146	..	7,488	..	7,488
	F	47	7,282	2	38	..	13,934	..	13,934
Total of 1930-31	C	328	73,750	8,147	1,63,605	50,038	7,78,679	40,010	8,68,727
	F	131	37,297	75	3,270	1,847	20,133	2,674	24,654
Total of 1929-30	C	309	77,300	7,939	1,59,944	49,771	7,63,181	49,996	8,62,948
	F	131	34,227	66	1,688	776	15,330	4,817	20,923

C—Concessionists. F—Free grantees.

There are no rights of way. The privileges conceded to the villagers under Settlement and under the Codes prescribed for each District were enjoyed by them as usual in all Circles. Free grants of timber and other forest produce were given on a liberal scale to poor people in deserving cases for construction and repair of houses and huts.

(c) Outturn and Sources of Forest Produce.

The outturn from all sources of forest produce during the two years 1930-31 and 1929-30 compares as follows :—

Circle	Year	Major Forest Produce			Minor Forest Produce		
		Timber C.ft. in thousands	Fuel C.ft. in thousands	Sandal-wood	Bamboos	Grass and grazing	Other minor produce
				Rs.	Rs.	Rs.	Rs.
Northern ..	1930-31 ..	2,370	10,033	237	60,809	5,46,199	41,556
	1929-30 ..	2,897	10,802	68	72,904	5,66,765	64,486
Central ..	1930-31 ..	496	3,924	3,303	15,336	4,67,775	66,382
	1929-30 ..	985	8,171	7,978	15,520	6,30,740	88,585
Southern ..	1930-31 ..	2,859	11,264	99,087	1,16,574	3,09,168	79,720
	1929-30 ..	2,503	11,117	1,07,155	1,29,745	3,83,904	91,764
Sind ..	1930-31 ..	161	12,317	..	..	62,048	18,717
	1929-30 ..	220	15,195	..	..	55,858	22,082
Total ..	1930-31 ..	5,886	38,138	1,03,617	1,92,719	14,45,190	2,06,375
	1929-30 ..	6,605	45,285	1,75,201	2,18,169	16,37,357	2,66,917
Difference ..		— 719	— 7,147	— 71,584	— 25,450	— 1,92,167	— 60,542

Of 21,51,405 animals admitted to grazing in the forests, 6,14,492 were allowed free. Corresponding numbers for the previous year were 24,50,960 and 5,33,946.

The grazing fees collected during the year amounted to Rs. 4,92,962 as compared with Rs. 5,71,681 in the previous year, the value at full rates for the year under review being Rs. 19,91,451. The decrease was mainly due to the fact that the collection of fees during the grazing season was very much retarded owing to the Congress agitation.

The total expenditure on management of state forests was :—

Circle	*1930-31*	*1929-30*
	Rs.	Rs.
Northern	3,67,226	4,96,993
Central	1,00,037	1,16,792
Southern	11,45,955	11,58,227
Sind	35,500	60,962
Total ..	16,48,718	18,32,974

The decrease is chiefly due to less expenditure on communications and buildings and on departmental operations in all Circles.

A reversing station on the Improvement No. 18 of Karanjadi-Harsul Road in the West Nasik Division. Cost Rs. 399-4-0

G P Z P 1932

CHAPTER IV-A.

THE ENGINEERING BRANCH.

The work of the Engineering Division during the year is described below under the following heads :—

1. Surveys,
2. Designs and Drawing Work,
3. Construction of Roads and Buildings,
4. Forest Exploitation—
   (*a*) Mechanical Extraction and
   (*b*) Saw-milling, and
5. General Remarks.

1. Surveys.

The Portuguese authorities having declined to allow the proposed Ozar-Saiwan Road to pass through their territory a new alignment had to be taken through extremely difficult country entirely within British limits. Several reconnaissances were made and the line finally selected, it is reported, is the best so far as cost of construction and avoidance of steep ascents and descents are concerned.

Field work in connection with the following roads was completed and plans and estimates for their construction were still in hand when the year closed :—

Circle	Division	Project	Length surveyed
			Miles.
Northern	.. West Nasik	.. Ozar-Saiwan Road ..	16
Northern	.. West Nasik	.. Ozar-Saiwan Road, a deviation in mile No. 1.	1
Northern	.. West Nasik	.. Ozar-Saiwan Road, chaining onward from Umbarvihir.	2
Northern	.. Surat	.. Navapur-Waghai Road, a deviation between Bhawandgad and Ahwa about.	1
Southern	.. E. D. Kanara	.. Mangalankop-Amatgar-Kurli Road.	7½
Southern	.. E. D. Kanara	.. Kirwatti-Hunsgeri Road ..	5¾
Southern	.. The Hulgod Nalla causeway (survey).		

In the Surat Division several culverts were lined out and the whole of the Waghai-Ahwa section of the Waghai-Nawapur Road project was inspected.

2. Designs and Drawing Work.

Buildings.—As usual plans and estimates in respect of all works, as called for by Divisional Forest Officers, were supplied and several estimates pertaining to various other projects were checked and scrutinized.

The design for a *katcheri* at Ahwa in the Dangs could not be completed owing to priority of other work and inadequacy of establishment.

3. Construction.

(*a*) *Roads.*—The following construction and repair work was carried out :—

		Rs.
1.	Drainage works on the Kadra-Shivpur Road ..	4,761
2.	Current repairs to culverts, Kadra-Shivpur Road	422
3.	Current repairs to the Tamange Ghat Road ..	920
4.	Part construction of the Birkhol Bridge ..	199

The Birkhol Bridge and culverts on the Kadra-Shivpur Road are being built according to special designs prepared by the Forest Engineer as described in last year's report.

An experimental expanded metal *nalla* crossing in lieu of a bridge was built on the Kadra-Shivpur Road. It consists of a boulder *bund,* thrown across a *nalla* subject to heavy flooding. The entire mass of boulders is enclosed in sheets of expanded metal linked together by means of wire and made fast to timber baulks embedded well below the *nalla* floor on both, the up and down stream, sides of the road. It is expected that this method should result in keeping the annual expenses on repairs down to the cost of merely spreading a few inches of murrum on the expanded metal surface of the roadway. The result of the experiment will not be known till after the rains are over.

In the Central Circle the construction of section II of the Dara-Dhadgaon Road in the mountainous region of the Satpuras in the North Khandesh Division presented some intricate engineering problems which were successfully solved.

(*b*) *Buildings.*—No new buildings were constructed. Repairs to the quarters of the engineering staff, the store house and the water reservoir at Dandeli were carried out at a total cost of Rs. 660.

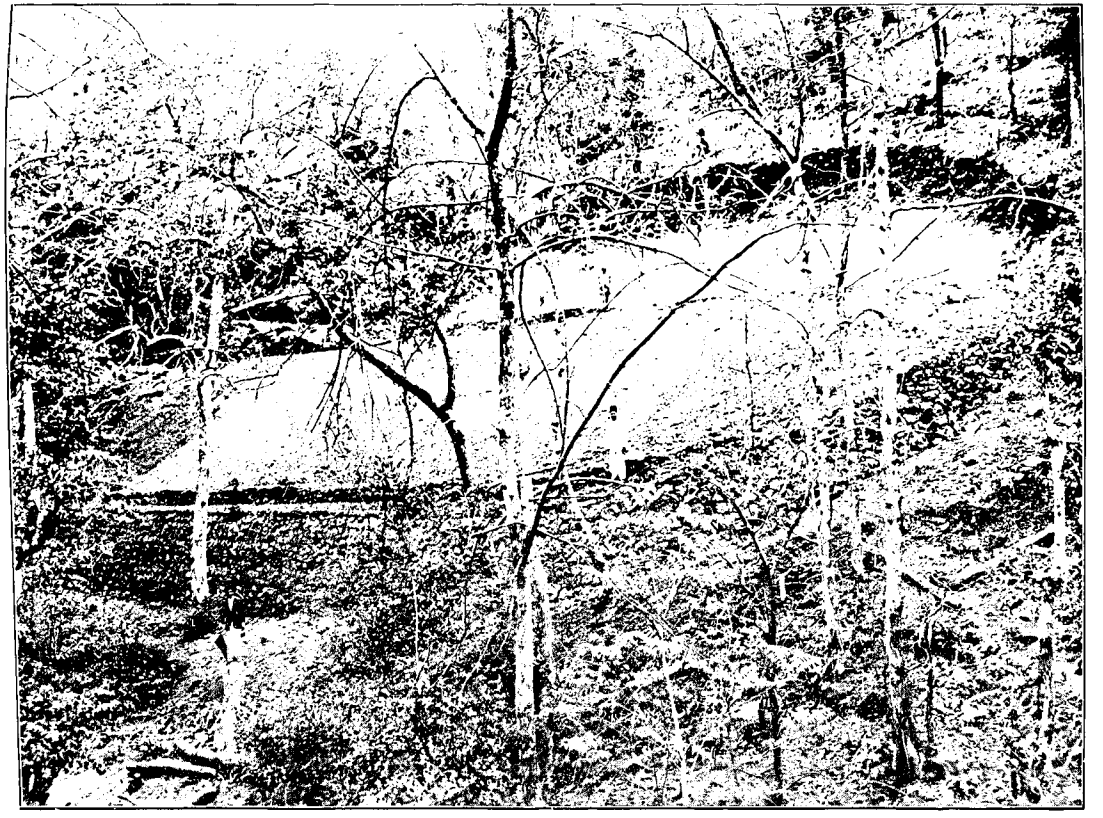
General technical supervision was exercised over the sinking of a well in Gund, which is being constructed according to plans and estimates prepared and supplied by the Forest Engineer.

4. Forest Exploitation.

(*a*) *Mechanical Extraction.*

(*i*) *Fordson Outfits.*—The two Fordson outfits worked in two widely separated localities, viz. in the Nagzhari Valley and on the Kaneri slopes in Gund. The individual working of the outfits, it is reported, has brought about a general reduction in working costs by distributing the charges on account of establishment, supervision and depreciation between the two units.

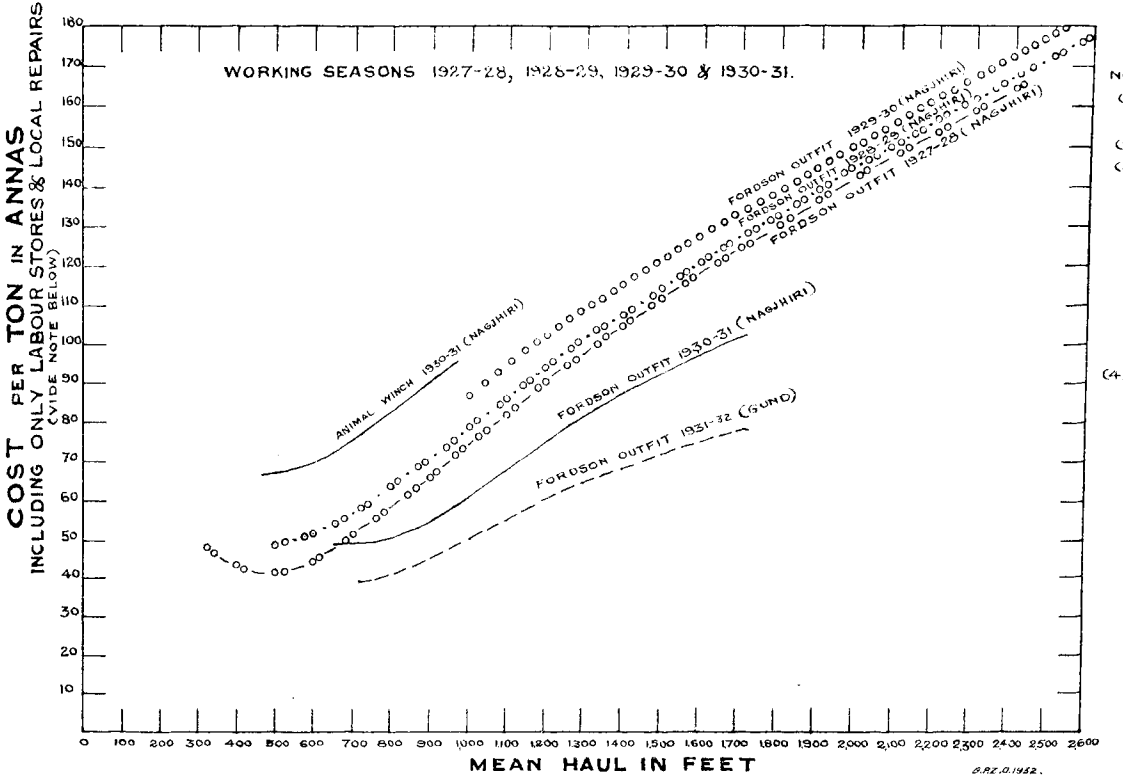
Nagzhari Valley Exploitation.—Tractor skidding was in operation for the whole season from November 1930 to March 1931. The total output



A dry Rubble Retaining Wall for the reversing station on improvement No. 18 on Karanjali—Harsul road section. Cost Rs 400.

G. P. Z. P. 1932

ANALYSIS OF COSTS OF LOG SKIDDING IN NAGJHIRI & KANNERI VALLEYS


WORKING SEASONS 1927-28, 1928-29, 1929-30 & 1930-31.
COST PER TON IN ANNAS
INCLUDING ONLY LABOUR STORES & LOCAL REPAIRS
(VIDE NOTE BELOW)
MEAN HAUL IN FEET
ANIMAL WINCH 1930-31 (NAGJHIRI)
FORDSON OUTFIT 1930-31 (NAGJHIRI)
FORDSON OUTFIT 1931-32 (GUND)
FORDSON OUTFIT 1929-30 (NAGJHIRI)
FORDSON OUTFIT 1928-29 (NAGJHIRI)
FORDSON OUTFIT 1927-28 (NAGJHIRI)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600
10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180

S.R.Z.O.1932.

NOTES:—

(1) WORKING SEASON IS FROM 1ST NOVEMBER TO 30TH MAY

(2) ONE TON = 50 CFT

(3) TO COVER INTEREST, DEPRECIATION & SUPERVISION CHARGES FOR FORDSON OUTFIT ADD:—

1927-28	69	ANNAS PER TON	INCLUDING HALF PAY OF THE FOREST ENGINEER FOR 6 MONTHS	
1928-29	119	DO		
1929-30	207	DO		
1930-31	117	DO (NAGJHIRI)		
DO	65	DO (GUND)		

(4) TO COVER CHARGES FOR SPECIAL REPAIRS ETC ADD:—

1927-28	4	ANNAS PER TON	
1928-29	10	DO	DO
1929-30	3	DO	DO
1930-31	7·5	DO	(NAGJHIRI)
DO	9	DO	(GUND)

amounted to 642·80 tons against 551·58 tons last year, while the all-in-working costs averaged Rs. 13-8-0 per ton against Rs. 23-3-8 per ton last year. The decrease is attributed to a shorter average length of haul which was 1,189 feet as against 1,655 feet last year and to the separate working of the two outfits referred to above.

Kaneri Slopes Exploitation.—The Fordson outfit successfully replaced the former animal power winch. The total output aggregated 964·72 tons as against 459·98 tons extracted last year by animal winch.

Working costs including all charges averaged Rs. 8-9-4 per ton with an average length of haul of 986 feet as compared with Rs. 9-6-11 per ton with an average lead of 849 feet by animal winch in the previous year.

The successful substitution of mechanised winch haulage for animal power has awakened interest in the question of reconstructing and reopening the old timber slide in Gund and making extended use of machinery in this region for all work of departmental extraction and transport. The issues raised are being examined in all aspects.

The chart facing this page is an analysis of skidding costs in the Nagzhari Valley from 1927-28 to date, and in Gund for 1930-31.

(*ii*) *Animal Winch.*—This outfit worked under the immediate control of the Exploitation Officer, Kanara Northern Division, in compartment No. 25, in the Nagzhari Valley from November 1930 to March 1931. The total quantity of timber skidded was 439·41 tons as against 541·94 tons last year, and the length of haul averaged 682 feet as compared with 772 feet last year, while working costs inclusive of all charges amounted to Rs. 12-12-6 per ton against Rs. 9-12-9 per ton last year.

(*b*) *Saw-milling.*

1. *Preliminary.*—The following saw-mills were worked departmentally :—

Northern Circle	.. 1.	The Dangs Mill located first at Chikhalda and later at Sundha.
Northern Circle	.. 2.	The Nasik Mill located at Haste in Peint.
Southern Circle	.. 3.	The Dandeli Mill in Kanara Northern Division.
Southern Circle	.. 4.	The Foden Portable Mill at Bomanhalli in Kanara Northern Division.
Southern Circle	.. 5.	The Kirwatti Mill in Kanara Eastern Division.

The mills in the Southern Circle were engaged mainly on turning out sleepers for supply to Railways and those in the Northern Circle were used for the conversion of waste timber from fellings, into scantlings and boards, the higher class timber being sold in log form.

2. *General.*—The year's working as compared with last year's has resulted in a satisfactory reduction in the average cost of conversion exclusive of charges on account of depreciation, interest and supervision

and in an appreciable increase in output. Figures for the last 5 years are given below :—

Year	Output of sawn material	Average cost of conversion (stores, labour and establishment charges only)
	Cft.	
1926-27 ..	388,660	5·82 annas per cft. of converted timber.
1927-28 ..	417,480	4·98 annas per cft. of converted timber.
1928-29 ..	334,753	5·42 annas per cft. of converted timber.
1929-30 ..	312,453	4·96 annas per cft. of converted timber.
1930-31 ..	326,450	4·48 annas per cft. of converted timber.

3. *Deadstock and stores.*—The dead stock of each mill was checked with the registers which were corrected and brought up to date, all unserviceable articles being written off under proper authority.

Dead stock and consumable stores to the value of Rs. 5,888 and Rs. 19,719 were supplied to various mills during the year.

Practically the whole of the requirements of the Engineering branch is purchased through the agency of the Indian Stores Department and, because the stores supplied are of the best approved quality, they form a very important factor in keeping the working costs as low as they are.

Increase or Decrease in Number of Mills.—There was no change in the number of saw-mills.

Progress of Saw-milling.—The mill in the Dangs was moved from Chikhalda to Sundha in the Khapri Valley.

Statement A given below compares the outturn and costs of working under various heads for the years 1928-29, 1929-30 and 1930-31.

TABLE "A".

Name of mill	Output during the year in cft.			Average sawing cost per cft. Stores		
	1928-29	1929-30	1930-31	1928-29	1929-30	1930-31
Dandoli Mill ..	132,050	127,628	113,466	0·91	1·15	0·92
Foden Portable ..	Experimental.	25,219	34,446	Experimental.	1·27	1·28
Bomanhalli Mill ..	46,501	Closed down.	....	0·91	Closed down.	....
Kirwatti Mill ..	33,817	39,072	53,337	1·80	1·35	0·72
Badgi Mill ..	29,827	4,980	Closed down.	1·37	2·12	Closed down.
Haste Mill ..	30,336	45,553	59,571	1·77	1·53	0·81
Chikhalda Mill (Sundha-Dangs)	62,222	70,001	65,630	1·29	1·31	1·22
Total for Presidency	334,753	312,453	326,450	1·22	1·30	0·94

Average sawing cost per cft.—*contd.*

Name of Mill	Labour			Establishment			Total excluding overhead charges		
	1928-29	1929-30	1930-31	1928-29	1929-30	1930-31	1928-29	1929-30	1930-31
Dandeli Mill ..	3·61	3·61	3·78	0·68	0·45	0·61	5·20	5·21	5·31
Foden Portable ..	Experimental.	2·47	2·33	Experimental.	1·15	1·02	Experimental.	4·89	4·63
Bomanhalli Mill..	2·45	Closed down.	..	1·39	Closed down.	..	4·75	Closed down	..
Kirwatti Mill ..	3·35	2·75	2·45	0·97	0·83	0·47	6·12	4·93	3·64
Badgi Mill* ..	3·73	3·20	Closed down.	1·24	1·24	Closed down.	6·34	6·56	Closed down.
Haste Mill ..	2·90	2·05	1·80	1·10	0·80	0·56	5·77	3·38	3·17
Chikhalda Mill (Sundha-Dangs).	2·67	2·57	2·83	0·98	0·90	0·90	4·94	4·78	4·95
Total for Presidency.	3·20	2·94	2·86	1·00	0·72	0·68	5·42	4·96	4·48

* Closed on 22nd May 1929.

Compared with last year's figures it will be noticed that, whereas the Dandeli and Chikhalda mills show a reduced outturn at a slightly higher rate of cost of conversion, the remaining three mills show a very substantial increase in output and a decrease in cost of conversion, the net result being a satisfactory increase in the total outturn of sawn material and decrease in the general average costs of conversion.

Organization.—The revision of the layout of one-half of the Dandeli Mill was carried out during the year, when the old wooden vertical saw was removed and its place taken by a modern Heacock Mill with travelling carriage after American practice. Advantage was taken of this opportunity to introduce some system into the layout, and thus, in the revised portion, all raw material comes in at the log depôt end and, passing straight through the mill goes out, after conversion, towards the seasoning sheds. Besides arranging a log deck at the height of a saw-bench, a dead-roller-way was built running through the length of the mill, with side-rails leading to other benches. By its use the heaviest timber can easily be pushed along by hand, and slid on to side rails for re-sawing by circular and other saws. The object of this revision is to save labour and this is achieved by logs coming into the mill at the proper level, and remaining at that level, until the finished sawn timber is finally disposed of at the far end of the mill, thus saving much heavy manual labour. The Heacock Mill, in addition, works at anything up to 80 times the speed of the Machine it replaced. The defect at Dandeli

is lack of power, caused by adding to the number of saws to be operated from time to time until the motive power has been taxed to its utmost. Schemes to remove this defect have been considered and a more powerful engine, hitherto idle, is being brought from the Northern Circle. When this is installed a decided improvement should result and, in addition, it will allow the engine which it will replace to be moved to Kirwatti, for replacing the low-powered engine now working there. It is hoped to complete the entire revision of the Dandeli Mill in due course, in which case there will probably be a still further saving in the amount of manual labour required. The cost of the alterations suggested is proposed to be kept down to a minimum by utilizing old material, now lying idle, and by making use of the services of the Forest Engineer's skidding and other establishment normally employed in the jungle.

The necessity for bringing the engineering stores up to date has long been felt, and it is hoped to carry this out effectively in the near future. The stores carried are of very considerable value, and are subject to annual commercial audit. With the present arrangement of having the stores and the workshop mixed up together, there is inefficiency and lack of control of both branches. A start has been made therefore to separate the two branches. One-half of the store-house building hereafter will be used solely for stores, entirely separate from the other half (front) which will be converted into a fully equipped workshop for overhauling tractors and skidders and carrying out other work, particularly during the monsoon. The entrance to this latter portion has been altered, and shelves removed, so that tractors, trailers, etc., can be driven straight into the workshop instead of requiring man-handling as heretofore.

A work-bench will be provided, with suitable tools so as not only to facilitate the annual overhaul of the tractors and skidders, but to enable our own (trained) establishment to do much other work which had hitherto to be sent elsewhere. The Storekeeper's Office, hitherto located in the darkest corner of the " Stores," has been moved to the west end of the building, and is now both well lighted and airy. The stock of stores will be ranged along shelves in the stores half of the shed to facilitate checking. In fact, the stores will now be run on modern methods, divided as they will be into workshops and store-house each self-contained and under separate efficient control. It is hoped to complete the work described above by the end of the monsoon, using the existing establishment to carry out the improvements proposed.

Mill Trading Accounts.—The Commercial Audit Department audited the trading accounts of the Dandeli and Chikhalda saw-mills and the stores account of the forest engineering division for the year 1929-30 and the Chief Conservator's remarks on the audit reports were submitted to Government.

The following are the trading accounts in respect of the 5 mills which worked during the year :—

Trading account of the Sundha Saw-mill for the year 1930-31.

Capital cost Rs. 66,492 + 212 = 66,704 — 33,572 = 33,112.

Expenditure			Income		
	Rs.	Rs.		Rs.	Rs.
I. Timber (unconverted) 133,224 cft. at 0-4-0 per cft.		33,306	I. Sales—		73,412
			Sales of sawn material during the year 63,656 cft.	87,431	
II. General stores ..		5,047	*Less*—		
III. Establishment ..		10,375	Stock of sawn material at the end of the previous year 39,338 cft.	69,201	
IV. Labour ..		7,640		26,230	
V. Depreciation on capital cost.		3,292			
VI. Interest on capital cost at 5·39 per cent.		5,279	*Add*—		
			Stock of sawn timber at the end of the year 41,312 cft.	47,182	
VII. Repairs to buildings.		..			
VIII. Miscellaneous—		14,910	II. Miscellaneous receipts.		717
(*a*) General ..	2,822		Loss for the year ..		5,720
(*b*) Carting sawn material to sale depôt ..	12,088				
		79,849			79,849

Trading Account of the Haste Saw-mill for the year 1930-31.

Capital cost Rs. 29,519 + 67 = 29,586 — 8,408 = 21,178.

Expenditure			Income		
	Rs.	Rs.		Rs.	Rs.
I. Timber (unconverted) 121,110 cft. at 0-6-0 per cft.		45,416	I. Sales—		66,335
			Sale of sawn timber at an average rate of Rs. 1-10-0, 37,362 cft.	60,646	
II. General Stores ..		3,023			
III. Establishment ..		3,753			
IV. Labour ..		6,704	*Add*—		
V. Depreciation on capital cost.	1,247		Stock of sawn timber at the end of the year 76,529 cft.	1,01,881	
	115				
		1,362		1,62,527	
VI. Interest on capital cost at 5·39 per cent.		6,242	*Less*—		
VII. Repairs to buildings.		21	Stock of sawn timber at the end of the previous year 54,320 cft.	96,192	
VIII. Miscellaneous ..		376			
			II. Miscellaneous receipts.		1,790
IX. Carting sawn material ..		8,788	Loss for the year ..		7,560
		75,685			75,685

Trading Account of the Dandeli Saw-mill for the year 1930-31.

Capital cost Rs. 1,15,705 + 4,065 = 1,19,770 — 55,063 = 64,707.

Expenditure			Income		
	Rs.	Rs.		Rs.	Rs.
I. Timber (unconverted) 157,579 cft.		1,41,950	I. Sales—		2,81,788
			Sale of sawn material during the year 107,290 cft.	2,79,054	
II. General Stores ..		7,135			
III. Establishment ..	27,232 4,622	31,854			
			Less—		
IV. Labour ..		7,883	Stock of sawn timber at the end of the previous year 31,830 cft.	67,141	
V. Depreciation on capital cost.	1,594 2,561	4,155		2,11,913	
			Add—		
VI. Interest on capital at 5·39 per cent.		6,961	Stock of sawn timber at the end of the year 38,006 cft.	69,875	
VII. Repairs to buildings.		359			
VIII. Miscellaneous ..		8,896	II. Miscellaneous receipts.		559
Profit for the year ..		73,154			
		2,82,347			2,82,347

Trading account of the Foden Portable Saw-mill for the year 1930-31.

Capital cost Rs. 24,925 + 89 = 25,014 — 10,164 = 14,850.

Expenditure			Income		
	Rs.	Rs.		Rs.	Rs.
I. Timber (unconverted) 46,558 cft.		13,823	I. Sales—		50,908
			Sale of sawn timber during the year 24,599 cft.	53,135	
II. General stores ..		2,755			
III. Establishment ..	6,936 744	7,680			
			Less—		
IV. Labour ..		554	Stock of sawn material at the end of the previous year 12,227 cft.	25,336	
V. Depreciation on capital cost.	25 1,206	1,231		27,799	
VI. Interest on capital at 5·39 per cent.		2,196	*Add*—		
VII. Repairs to buildings.		567	Stock of sawn timber at the end of the year 22,074 cft.	23,109	
VIII. Miscellaneous ..		1,993	II. Miscellaneous receipts.		..
IX. Carting of sawn material.		5,297			
Profit for the year ..		14,812			
Total ..		50,908			50,908

Trading account of the Kirwatti Saw-mill for the year 1930-31.

Capital cost Rs. 19,709 + 1,035 −12,853 = 7,891.

Expenditure			Income		
	Rs.	Rs.		Rs.	Rs.
I. Timber (unconverted) 100,618 cft. ..		39,023	I. Sales—		1,05,675
II. General stores ..		2,419	Sale of sawn timber during the year 48,322 cft. ..	98,996	
III. Establishment ..	8,673 2,739		*Less*—		
		11,412	Stock of sawn timber at the end of the previous year 14,766 cft. ..	18,151	
IV. Labour ..		1,917		80,845	
V. Depreciation ..	37 911				
		948	*Add*—		
VI. Interest on capital at 5·39 per cent. ..		1,332	Stock of sawn timber at the end of the year, 19,781 cft. ..	24,830	
VII. Repairs to buildings.		234			
VIII. Miscellaneous expenditure including cost of carting sleepers ..		11,362	II. Miscellaneous receipts.		1,660
Profit for the year ..		38,688			
Total ..		1,07,335			1,07,335

The mills on the whole showed a net profit of Rs. 1,13,374 as against Rs. 2,04,942 last year. All the mills in the Southern Circle have been less profitable, while both the mills in the Northern Circle have shown a loss. The decrease in the net profit of the mills is due partly to the heavy fall in sale prices during the year and partly to the fact that the stock of timber on hand was valued last year at selling price, whereas in the current year's account it is valued at cost price according to the instructions of the Commercial Audit Department.

5. *General Remarks.*—During the year a building, eminently suitable for a drawing office and at the same time obtainable on a lower rate of rent than the premises vacated, was taken over on lease as an office for the Forest Engineering Division. This building besides providing ample accommodation for the clerks and the officers, has stone flooring throughout, is well lighted and has water laid on. The last named convenience has rendered it possible to have a room equipped and set apart for preparing blue prints expeditiously and efficiently. The ready compliance of the owner of the building with the suggestions of the Forest Engineer is responsible for the conveniences afforded.

The strength of establishment in the Engineering branch has been kept at the absolute minimum required to maintain efficiency. The Forest Engineer reports that he is well satisfied with the work of his

staff and gives special credit to Head Supervisor Mr. Thakar for the excellent alignment secured for the proposed Ozar-Saiwan road.

CHAPTER V.

FINANCIAL RESULTS.

(Forms Nos. 68, 69 and 70.)

The revenue and expenditure of the year compared with those of the last year and the average of the previous quinquennium 1925-26 to 1929-30 as follows :—

Circle	Year	Revenue	Expenditure				Surplus or deficit	Percentage of surplus to gross revenue
			Conservancy Maintenance and Regeneration	Forest Capital Outlay	Establishment	Total		
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Northern	1930-31	13,91,513	2,97,624	90,141	7,25,361	11,22,126	2,69,387	19·4
	1929-30	28,02,552	3,63,575	1,46,422	7,04,640	12,14,646	15,87,906	56·7
	Average	26,55,177	4,00,000	1,24,068	6,76,835	12,01,807	14,53,370	54·7
Central	1930-31	8,91,320	88,603	20,980	5,07,174	7,06,713	1,84,607	20·7
	1929-30	12,60,493	96,804	35,664	5,80,170	7,21,138	5,30,365	42·8
	Average	12,45,304	1,05,718	29,775	5,82,150	7,17,643	5,27,661	42·3
Southern	1930-31	23,72,805	11,00,019	46,016	6,44,960	17,90,995	5,81,810	24·5
	1929-30	32,98,598	11,07,182	51,180	6,18,803	17,77,115	15,21,483	46·1
	Average	29,63,776	10,50,527	62,109	6,22,441	17,35,077	12,28,699	41·5
Sind	1930-31	5,67,519	27,020	7,580	3,21,152	3,56,652	2,10,867	37·2
	1929-30	6,11,165	57,219	8,833	3,05,255	3,66,307	2,44,858	40·1
	Average	6,07,595	87,409	4,274	2,95,009	3,86,692	3,10,903	44·5
General Direction.	1930-31	8	1,07,742 (a)	..	83,299 (b)	1,91,041	−1,91,033	..
	1929-30	19	95,779	11	77,865	1,73,655	−1,73,636	..
	Average	21	45,266	126	97,394	1,42,786	−1,42,765	..
Forest Engineering.	1930-31	335	26,510	2,197	48,841	77,548	−77,213	..
	1929-30	612	25,265	−15,090	47,258	57,433	−56,821	..
	Average	1,884	43,308	2,976	63,628	1,09,912	−1,08,028	..
Total Presidency.	1930-31	52,23,500	16,48,418	1,75,870	24,20,787	42,45,075	9,78,425	18·7
	1929-30	79,73,439	17,45,274	2,22,020	23,43,000	43,10,294	36,63,145	46·0
	Average	75,63,757	17,82,237	2,24,223	23,37,457	42,03,917	32,69,840	43·2
Difference between	1930-31 and 1929-30	−27,49,939	−96,856	−46,150	+77,787	−65,219	−26,84,720	..

N.B.—The above figures are exclusive of expenditure under B-V—Famine Fodder charges and B-VIa—Work advances as the former expenditure is to be met from the Famine Relief Fund and the latter expenditure is recoverable.

(*a*) Includes Rs. 1,07,575 on account of interest on past Forest Capital Outlay.
(*b*) Includes Rs. 1,401 on account of loss by exchange.

The year under report was financially most unsatisfactory, as there was a calamitous and unprecedented drop in revenue. The gross revenue of the year fell by Rs. 27,49,939 as compared with that of the previous year and by Rs. 23,40,257 as compared with the average of the preceding 5 years, while the fall in the surplus was respectively Rs. 26,84,720 and Rs. 22,91,415. The fall is shared by all Circles in the Presidency and the main reason therefor is acute depression in the timber trade rendered doubly so by the continued success of the Congress campaign of boycott and picketing, and natural unwillingness of the usual purchasers to take risks in so uncertain a political situation as was brought about by the Civil Disobedience Movement. Non-sale of coupes, compartments and minor produce farms, boycott of timber sales at Depôts, low realisations for timber at auction sales, for coupes, minor produce farms, grass and grazing were largely the result of direct Congress activities and so heavy a loss can only in part be ascribed to trade depression itself.

There was a decrease in expenditure under "B-Conservancy, Maintenance and Regeneration", all Circles contributing thereto. The Conservators have given the following reasons :—

Departmental fellings for saw-mills in the Northern Circle were not so intensively carried out as in the previous year and economy was effected by restricting expenditure to urgent items. A smaller amount than last year was spent on repairs to roads and buildings generally in the Central Circle, and payments to the khots in the Kolaba Division were less than usual. Nearly all departmental works were stopped in the Sind Circle owing to unfavourable market conditions and there was also no demand for *babul* logs from the Gun Carriage Factory.

The expenditure under 52-A was greatly curtailed during the year owing to continued financial stringency.

The increase in expenditure under C-Establishment was due partly to annual increments, and increased permanent travelling allowance sanctioned, with retrospective effect, to officers promoted to Class I and partly to the fact that very few officers were on leave out of India during the year.

The sources of revenue are analysed and compared below :—

Sources and heads	General Direction	Forest Engineering	Northern Circle	Central Circle
	Rs.	Rs.	Rs.	Rs.
REVENUE.				
Ia and IIa.—Timber	....	....	10,87,845	1,67,467
Ib and IIb.—Firewood	....	....	23,426	1,01,147
Ic and IIc.—Bamboo	....	....	55,689	14,001
Id.—Sandalwood	....	....	237	2,615
IId.—Grazing and Grass ..	....	....	1,12,906	4,12,056
Ie and IIe.—Other produce ..	....	....	32,498	52,389
III.—Drift and Confiscated forest produce.	....	....	121	1,445
IV.—Forests not managed by Government.	....	....	2,401	20,841
V.—Miscellaneous	8	335	78,251	1,34,565
Refunds ..	....	....	—1,861	—15,208
Total ..	8	335	13,91,513	8,01,320

Southern Circle	Sind Circle	Total		Increase or decrease
		1930-31	1929-30	
Rs.	Rs.	Rs.	Rs.	Rs.
17,69,189	62,874	30,87,375	53,16,452	−22,29,077
1,86,583	3,18,484	6,29,040	7,92,567	−1,62,927
71,122	....	1,40,814	1,67,622	−26,808
1,24,882	....	1,27,734	1,49,571	−21,837
81,577	41,132	6,47,071	8,42,889	−1,95,218
52,235	18,212	1,55,334	2,27,108	−71,774
334	386	2,286	2,554	−268
10	....	23,252	42,047	−18,795
88,121	1,28,860	4,30,140	4,64,122	−33,982
−1,248	−2,429	−20,746	−31,493	+10,747
23,72,805	5,67,519	52,23,500	79,73,439	−27,49,939

The heads of expenditure are analysed and compared below :—

Sources and heads	General Direction	Forest Engineering	Northern Circle	Central Circle
1	2	3	4	5
	Rs.	Rs.	Rs.	Rs.
EXPENDITURE.				
B.—Conservancy, Maintenance and Regeneration and				
52-A—*Capital Outlay on Forests.*				
I. Timber, etc., extracted by Government agency.	....	9,822	129,638	16,340
II. Timber, etc., extracted by consumers or purchasers.	....	....	36,635	15,268
III. Maintenance, Repairs and Renewals, 52-A-III, 52-A-IV and 52-A-V.	....	19,437	1,34,759	34,014
IV. Conservancy and Regeneration, 52-A-I, 52-A-II.	....	....	58,734	19,800
V. Miscellaneous	167	—552	36,999	24,117
Interest	1,07,575	....	....	....
Total ..	1,07,742	28,707	3,96,765	1,09,539
ESTABLISHMENT.				
I. Pay of officers	36,680	13,826	1,37,223	1,02,833
II. Pay of Establishments ..	12,084	21,685	4,57,844	3,91,121
III. Allowances	24,280	10,385	1,08,323	89,685
IV. Contingencies	2,004	2,945	21,971	15,031
V. Establishment charges payable to Central Government.	6,850	....	....	....
Recoveries from Raisingpur Estate.	....	....	....	—1,500
Loss due by exchange	1,401	....	....	....
Total ..	83,299	48,841	7,25,361	5,97,174
Grand Total ..	1,91,041	77,548	11,22,126	7,06,713
Surplus 1930-31	—1,91,033	—77,213	+2,69,387	+1,84,607
Surplus 1929-30	—1,73,636	—56,821	+15,87,906	+5,39,355
Difference	—17,397	—20,392	—13,81,519	—3,54,748

Southern Circle	Sind Circle	Total		Increase or decrease
		1930-31	1929-30	
6	7	8	9	10
Rs.	Rs.	Rs.	Rs.	Rs.
9,52,571	9,957	11,18,328	11,78,233	−59,905
4,962	827	57,692	57,797	−105
1,22,325	14,920	3,25,455	4,02,078	−76,623
55,940	4,897	1,39,371	1,34,856	+4,515
10,237	4,899	75,867	98,777	- 22,910
....	....	1,07,575	95,553	+12,022
11,46,035	35,500	18,24,288	19,67,294	−1,43,006
1,19,399	82,009	4,91,970	4,60,115	+31,855
4,14,477	1,66,340	14,63,551	14,38,305	+25,246
93,873	54,826	3,81,376	3,61,800	+19,576
17,211	17,977	77,139	78,150	−1,011
....	....	6,850	5,600	+1,250
....	....	1,500	−1,969	+469
....	....	1,401	999	+402
6,44,960	3,21,152	24,20,787	23,43,000	+77,787
17,90,995	3,56,652	42,45,075	43,10,294	−65,219
+5,81,810	+2,10,867	+9,78,425	....	....
+15,21,483	+2,44,858	....	+36,63,145	....
−9,39,673	−33,991	....	....	−26,84,720

The Revenue and expenditure are further analysed as follows :—

Class	General Direction Division and Forest Engineering		Northern Circle		Central Circle	
	Rs.	Per cent.	Rs.	Per cent.	Rs.	Per cent.
REVENUE.						
Major Produce	....	..	11,11,508	80	2,71,229	30
Minor Produce	....	..	2,01,093	14	4,78,448	51
Miscellaneous	343	100	80,773	6	1,56,851	18
Refunds	....	..	−1,861	..	−15,208	−2
Total ..	343	..	13,91,513	..	8,91,320	..
EXPENDITURE.						
Conservancy, Maintenance and Regeneration and 52-A.						
Extension and constitution	....	..	1,230	..	....	..
Improvement	1,510	1	1,87,465	47	50,181	46
Exploitation	27,165	20	1,95,045	49	44,742	41
Miscellaneous	199	..	13,025	4	14,616	13
Interest	1,07,575	79	....	..	....	..
Total ..	1,36,449	..	3,96,765	..	1,09,539	..
ESTABLISHMENT.						
Administrative	67,652	51	39,398	5	42,583	7
Executive	48,841	37	2,09,375	29	1,70,796	29
Protective	15,647	12	4,76,088	66	3,83,795	64
Total ..	1,32,140	..	7,25,361	..	5,97,174	..

Class	Southern Circle		Sind Circle		Total	
	Rs.	Per cent.	Rs.	Per cent.	Rs.	Per cent.
REVENUE.						
Major Produce	20,80,654	88	3,81,359	67	38,44,750	73
Minor Produce	2,04,933	8	59,344	10	9,43,818	18
Miscellaneous	88,466	4	1,29,245	23	4,55,078	9
Refunds	−1,248	..	−2,429	..	−20,746	..
Total ..	23,72,805	..	5,67,519	..	52,23,500	..
EXPENDITURE.						
Conservancy, Maintenance and Regeneration and 52-A.						
Extension and constitution ..	....	..	78	..	1,308	..
Improvement	1,67,757	15	18,634	52	4,25,547	23
Exploitation	9,68,049	84	11,889	34	12,46,890	68
Miscellaneous	10,229	1	4,899	14	42,968	3
Interest	....	..	....	..	1,07,575	6
Total ..	11,46,035	..	35,500	..	18,24,288	..
ESTABLISHMENT.						
Administrative	50,448	8	54,041	17	2,55,522	10
Executive	2,13,434	33	1,25,696	39	7,68,142	32
Protective	3,81,078	59	1,40,515	44	13,97,123	58
Total ..	6,44,960	..	3,21,152	..	24,20,787	..

The expenditure incurred during the year from the provision under 52-A—Capital Outlay on Forests, subsequently charged to Revenue, is as shown below :—

Heads	General Direction	Northern Circle	Central Circle	Southern Circle	Sind Circle	Forest Engineering	Total
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
I. Forest Surveys ..	..	714	..	..	..	..	714
II. Organization Improvement and extension ..	..	1,711	184	6,457	215	..	8,567
III. Communications and Buildings	..	97,904	17,854	38,814	6,570	..	1,61,142
IV. Railways and Tramways .	..	..	..	..	..	..	..
V. Livestock, Stores, Tools and Plant	..	3,146	2,898	817	795	2,782	10,438
Deduct—Receipts and Recoveries on Capital Account.	..	— 4,334	..	— 72	..	585	— 4,991
Total ..	..	99,141	20,936	46,016	7,580	2,197	1,75,870

The outstandings on account of revenue at the commencement and close of the year were :—

	On 1st April 1930	On 31st March 1931
	Rs.	Rs.
Northern Circle	1,12,065	1,77,547
Central Circle	5,886	10,010
Southern Circle	2,36,591	3,28,358
Sind Circle	2,00,576	1,30,625
Total ..	5,55,118	6,46,540

A sum of Rs. 16,158 was written off in the Northern and Southern Circles under proper authority.

The outstandings on account of contractors and disbursers were as follows :—

	On 1st April 1930	On 31st March 1931
	Rs.	Rs.
Northern Circle	2,154	4,380
Central Circle	175	34
Southern Circle	15,778	13,655
Sind Circle	2,269	449
Total ..	20,376	18,518

CHAPTER VI.

RESEARCH AND EXPERIMENTS.

General.—Problems relating to silviculture and forest economy, both of general and particular interest, are investigated under the orders and general direction of the Chief Conservator of Forests by selected Divisional Officers and their staff, while occasionally a few officers on their own initiative make experiments connected with matters which concern their divisions.

Results, which are reported to the Chief Conservator in all cases, are summarised in his office and put up for his criticism and orders. These latter are issued to all officers of the department for information and guidance.

Besides controlling the subject matter and general lay-out of research experiments the Chief Conservator inspects, while on tour, the work being done in the field and issues such instructions as may conduce to the proper conduct of the investigation in hand.

Of the 21 subjects with which the year opened, serial numbers 9, 19 and 26 gave results from which final conclusions have been drawn and, as no new subjects were taken up, the year closed with 18 subjects in hand requiring further observation.

The work done, the results recorded and conclusions arrived at are briefly described below.

Subject No. 2.—Germination tests of treated teak seed.

(Divisions—Surat, Kolaba, Belgaum, West Khandesh, Panch Mahals and S. D. Kanara.)

For the reasons reported last year experiments were undertaken with seed collected from one and the same tree in each locality and in one season to discover the merits of the following treatments :—

(*i*) Soaked and dried alternately 3 times for a week at a time.
(*ii*) Do. do. twice for a fortnight at a time.
(*iii*) Weathered in the rains and germinated the following year.

The results show that the percentage of germination varies between 2 and 78 for the weekly treatment and 0·7 and 66 for the fortnightly treatment, while the percentage of survival in both cases is over 70. The mean average percentage, however, shows hardly any difference in germination and very little in survivals, thus indicating that there is not much difference between the two treatments.

Whether this artificial treatment has any advantage over natural weathering has yet to be found out. For this purpose the result of seed sown during the ensuing rains under treatment No. (*iii*) has to be awaited.

Subject No. 4.—Effect of thinning of teak coppice at different ages.

(Division—East Thana.)

Four fresh sample plots, each 3 acres in extent, have been laid out in crops 8, 10, 12 and 14 years of age and initials recorded.

Subject No. 5.—Effect of different degrees of thinning in teak plantations of different ages.

(Divisions—West Nasik, West Thana and Belgaum.)

The second remeasurements of trees in the sample plots established for the purpose are not due till 1934.

Subject No. 7.—Annual girth increment of sandal.

(Divisions—Belgaum and Dharwar-Bijapur.)

So far only one remeasurement has been recorded. A few more remeasurements in both the Divisions are necessary before drawing any deductions.

Subject No. 8.—Increment of babul (Acacia arabica) under different degrees of thinning.

(Division—Hyderabad, Sind.)

Three sets of sample plots were laid out, one set in each of 3 areas in which the stock was 9, 11 and 14 years of age, and A, B and C thinnings were carried out in each in accordance with the scale of ordinary thinnings defined in the Dehra Dun Research Institute's classification of thinnings.

The experience gained so far indicated (1) that thinnings in pure *babul* forests can hardly be undertaken too early, (2) that if thinnings are carried out for the first time after the 10th year considerable damage results from wind-breaks.

The investigation requires to be continued for several years more before definite results showing the effect of thinnings on volume increment will be available.

Subject No. 9.—Propagation of lac on ber (Zizyphus Jujuba).

(Division—Karachi.)

As the results of several years' attempts to propagate lac on *ber* (Zizyphus Jujuba) in Sind show complete failure of the insect to establish itself, this investigation has been abandoned.

Subject No. 10.—The economic age for cutting bahan (Populus euphratica).

(Division—Shikarpur.)

There is nothing fresh to record.

Subject No. 12.—Artificial propagation of Rosha grass.

(Division—West Khandesh.)

Work in connection with this experiment could not be carried out, as designed, and that which was done did not yield satisfactory results. The experiment will be repeated next rains.

Subject No. 13.—*Propagation of hirda* (*Terminalia Chebula*).
(*Divisions—Satara and Poona.*)

The work done does not provide a basis for determining the best source from which seedlings should be obtained for transplantation. The experiment is being repeated.

Subject No. 16.—*Effect of improvement fellings on diameter growth.*
(*Division—Surat, Dangs.*)

Two plots of one acre each, one control 16-B, and the other improvement-felled 16-A, are under observation. The first set of remeasurements was taken in December 1930. The following are the results :—

	Improvement-felled plot	Control plot
Total diameter increment for the whole plot ..	113·05	55·84
Average diameter increment per tree	0·97	0·35

The average diameter increment in the improvement-felled plot is more than 2½ times that in the control plot.

The investigation is at too early a stage to yield conclusive results.

Subject No. 19.—*Coppicing of anjan* (*Hardwickia binata*).
(*Divisions—East Nasik, East Khandesh and West Khandesh*).

Experiments carried out since 1928 in the three Divisions in which *anjan* is common have yielded results which definitely justify the conclusions that in this Presidency—

(*i*) the most advantageous height at which to fell *anjan* is between 6″ and 12″ above ground level,

(*ii*) the best season to fell is between November and July (following), and

(*iii*) the most suitable exploitable age at which *anjan* should be felled to secure abundant coppice is that at which it attains a girth between 30″ and 40″.

It is to be observed that these results form a most useful basis for determining the suitable rotation for working the *anjan* forests of this Presidency.

Subject No. 26.—*Cost of artificially raising simul* (*Bombax malabaricum*).
(*Divisions—West Thana, North Thana and East Thana.*)

Four areas, i.e., two in West Thana, one in North Thana and one in East Thana, were maintained for research in the silvicultural treatment of Bombax malabaricum for a period of 4 years ending March 1931 and a careful record, in full detail, was kept as to the percentage of the

original number of plants surviving and the expenditure incurred on formation and upkeep. The results are tabulated below :—

Division	Area in acres	Percentage of surviving plants	Cost of formation per acre in Rs.	Cost of upkeep per acre per year in Rs.
West Thana	13	9·8	2·97	1·17
North Thana	12	43·18	8·65	4·7
East Thana	31	13·3	46·5	10·6

Note.—Planting out cuttings in West Thana has failed, there being no survivals.

The figures for North and West Thana are for dibbling seed in burnt rab patches while those for East Thana are for sowing on mounds.

The high cost of formation and subsequent upkeep rules out mound sowing for adoption as a method of raising *simul.*

Dibbling seed in rab beds in the same manner as *teak* appears to be the best method of propagating *simul* artificially, the cost of formation varying between Rs. 3 and 8 per acre of actual area sown and that of upkeep between 1 rupee and 5 rupees.

This investigation, which has now concluded, has definitely established that the silvicultural requirements of *simul* are—

(*i*) good soil—clayey and marshy soils are unsuitable,

(*ii*) annual weeding for 3 years after germination,

and has proved that *simul* can be raised more successfully and cheaply by dibbling seed in well-burnt rab beds in felled coupes than by sowing on mounds. The species suffers severely from termite attack and observation shows it to be unsuited for cultivation in pure formation for this reason alone. *Simul* seedlings under optimum conditions of soil and rainfall with proper and timely tending attain an average height of 4½ feet in four years.

Subject No. 27.—Reproduction of anjan (Hardwickia binata) by broadcast sowing, sowing in single plough drills and dibbling in patches in soils prepared according to different methods in closed and open forest.

(*Division—East Khandesh.*)

From the results obtained so far it cannot conclusively be stated whether regeneration of *anjan* should be attempted in open rather than closed forest, nor which treatment is most suitable for adoption on a large scale. When the third year's figures become available it may be possible to decide both the points referred to above. In the meantime figures of cost are being collected by the Division concerned, as cost is a vital factor in deciding the manner of carrying out regeneration operations.

Subject No. 28.—Effect of early burning on sandalwood growth and regeneration.

(Division—Belgaum.)

The two plots referred to in previous reports were under observation. During the last four years in Plot 28-A, fire-protected, the number of stems increased from 69 to 221, i.e. 320·2 per cent., while in Plot 28-B, early burnt every year, the corresponding figures are 252, 384 and 152·3 per cent.

The rate of current annual increase per cent. is slight in both plots but the difference in the rate has consistently been in favour of the unburnt plot and, although one year still remains for the completion of the experiment in hand, it is quite clear that early burning does not exert any stimulating influence on the germination of sandal seed; on the contrary sandal regeneration and growth respond to, and in fact demand, rigid fire-protection. The periodic increment for four years is overwhelmingly in favour of the fire-protected plot.

Subject No. 29.—The value of shrubs as nurses for artificially raised seedlings in scrub forests.

(Divisions—East Khandesh, West Khandesh and East Nasik.)

Experiments consisting of sowing the seed of certain selected species, such as *nim* (Melia Azadirachta), *khair* (Acacia Catechu), *anjan* (Hardwickia binata), *shisham* (Dalbergia latifolia), *shiwan* (Gmelina arborea), etc., in open situations and under the shelter of bushes were undertaken in the above Divisions.

The percentage of survival of seedlings raised under bushes is satisfactory but no definite conclusion can be drawn as to the value of shrubs as nurses. A repetition is being made of the experiment with typical scrub species in more than one locality in each of the above Divisions with the object of securing more reliable information connected with this investigation.

Subject No. 30.—Artificial propagation of safed musali (Chlorophytum tuberosum).

(Division—North Khandesh.)

From the results obtained this year it emerges very clearly that *safed musali* cannot be propagated by sowing, with any degree of success. As to the relative value of soils and the treatment required for successful propagation by means of planting tubers the following is the order of merit :—

(1) Murrum ploughed and burnt.
(2) Rocky soil unploughed and unburnt.
(3) Black-cotton soil unploughed and unburnt.

It does not seem convincing that, whereas murrum soil needs ploughing and burning the other 2 soils require neither for successful results. The

experiments however prove that murrum soil so treated is eminently suitable. The investigation is being repeated.

Costs are excessive as shown below :—

	Per acre	
	Sowing	Planting
	Rs. a. p.	Rs. a. p.
Ploughed burnt soil (i.e. rabs)	29 8 0	46 0 0
Unploughed burnt soil	25 8 0	42 0 0
Ploughed unburnt soil	4 8 0	21 0 0
Unploughed unburnt soil	0 8 0	17 0 0

The costs during the next year are expected to be lower as no special rabs will be prepared for burning.

Subject No. 31.—*To determine which of the following three methods tends to produce the maximum improvement in the condition of forked and branchy young transplants or seedlings.*

(1) Cutting back the plant.
(2) Carefully pruning the undesirable shoot or shoots.
(3) Breaking the top bud of the undesirable shoot or shoots.

(*Division—West Khandesh.*)

No work of any value was done. The experiment is being carried out afresh.

Subject No. 32.—*To discover whether any correlation exists between outer girth increment and heartwood increment of Sandal.*

(*Division—Dharwar-Bijapur.*)

No new facts came to light during the year. The investigation is proceeding.

Subject No. 33.—*The determination of the rate of increment of sawar* (*Bombax malabaricum*).

(*Division—Panch Mahals.*)

Remeasurements taken in April 1930 show that the rate of increment advances rapidly till a girth of 24″-30″, average 27″, is reached when it begins to decline gradually.

Three more remeasurements are to be taken before final conclusions can be drawn.

Subject No. 34.—*Effect of different degrees of thinning in teak plantations.*

(*Divisions—N. D., E. D., S. D. and W. D. Kanara.*)

Four plots have been laid out in accordance with the new Statistical Code, an advance type-script of which was obtained from Dehra Dun as soon as the final draft was ready.

The record of measurements has been kept on forms obtained from Dehra Dun and the computations will be carried out in the rains.

The selection of plots involved considerable difficulties owing to the uneven and partial stocking of the plantations in question which were all originally intended to give a uniform spacing of 6′ × 6′ over the area to be planted. It was impossible to get sub-plots containing the same or nearly the same number of trees. And the purely local factor of soil introduced variations in height growth which make another initial difference among the sub-plots. The selection of sub-plots was made with due regard to this circumstance.

Subject No. 35.—Artificial regeneration of sandalwood.
(Divisions—Satara, Dharwar-Bijapur and Belgaum.)

Experiments were carried out in the above-named divisions to discover—

(1) whether broadcast sowing or dibbling gives better results,
(2) the correct depth of dibbling,
(3) the effect of burnt soil on the vigour of the resultant seedlings, and
(4) the effect of removing the pulp from the seed, before sowing, on the percentage of germination.

In the Satara and Dharwar-Bijapur divisions the investigation for various reasons did not yield satisfactory results. But so far as the Belgaum division is concerned the experiments show clearly that

(1) dibbling gives better results than broadcasting, and
(2) that ½ inch of soil cover for the seed is the optimum depth for dibbling.

Removal of pulp is not really a practicable working proposition.

EXPERIMENTS CONDUCTED UNDER THE CONTROL OF DIVISIONAL FOREST OFFICERS.

(ii) Artificial regeneration.

Simul (Bombax malabaricum).

(1) Panch Mahals, North, East and West Thana and Surat Divisions :—

Sowing of *simul* in the same manner as teak in coupes within 12 miles of a bunder or railway station was continued during the year. Only in the Panch Mahals Division the results were not encouraging where, owing to unsuitable soil and unfavourable rainfall conditions, the percentage of survivals was very low.

(2) An experiment was started in the Panch Mahals Division with a view to ascertaining whether plants develop more vigorously when rabs are well ploughed before planting or sowing. Accordingly 20 rabs were ploughed at a total cost of Rs. 20 and 5,100 seedlings were transplanted therein. Out of these 3,184 survived. There was no visible difference in the condition of transplants in ploughed and unploughed rabs at the end of November. The experiment has shown clearly that ploughing is too expensive for general adoption.

Sandal (Santalum album).

N. D. Kanara.—Reproduction of sandal by root and shoot cuttings was tried. Of 10,000 cuttings put out, 50 per cent. gave shoots and 26 per cent. survived at the end of the season. Height growths of 6 to 24 inches were obtained. The results show that to be successful, planting should be done early in June and before the heavy rains of the monsoon have commenced.

Babul (Acacia arabica).

Working Plans Division, Central Circle.—Observations made during the year prove conclusively that the surest way of promoting germination of *babul* seed in areas beyond the reach of river flood water is to arrest the surface run off and hold up the water for sufficient time to permit thorough saturation of the soil. This can be done effectively and cheaply by means of interrupted contour trenches as described last year.

Miscellaneous species.

N. D. Kanara.—The experiments made last year to introduce jungle-wood species in the Haliyal Teak Pole area have now passed the experimental stage and endeavours are being made to carry out such work over the entire coupe. Dibbling seed in ploughed lines, about 6 feet apart, is the most convenient method and gives very satisfactory results, provided the lines are not allowed to collect water. The rate of growth during the first season depends upon the species used. *Honne* (Pterocarpus Marsupium), black wood and *dindal* (Anogeissus latifolia) do not attain a height of more than one foot while *matti* (Terminalia tomentosa) grows up to 1½ feet and *shivni* (Gmelina arborea) up to 6 feet.

Belgaum Division.—Experiments aiming at the introduction of *babul* (Acacia arabica) and *nim* (Melia Azadirachta) into the firewood coupes of the Gujnal and Gokak Ranges were continued during the year. The seed of the above species collected, generally from the droppings of sheep and goats, were dibbled on ploughed charcoal kiln sites, 1″ deep with a spacing 3′ × 3′ and in some places 4′ × 4′. The results are encouraging. In the Gujnal Range a mixture of teak, *nim* and *babul* was tried; the percentages of germination and survivals being—

	Teak	Babul	Nim
Germination percentage	31	59	50
Survival percentage	74	85	75

Experiments were also made to introduce *shigekai* (Acacia concinna). 600 transplants were put out in Jamboti and Kankumbi forests and of these 30 per cent. in the first case and 70 per cent. in the second are reported to be surviving.

Sukkur.—All the seedlings of the four species of Eucalyptus experimented with in the Adilpur forest died off after they were transplanted. Similarly in the Shahpur forest seedlings of Eucalyptus creba and Eucalyptus globulata have all succumbed; there remains surviving now in this area only one tree (Eucalyptus globulus) which is

about 10 feet high. Eucalyptus apparently does not stand transplanting in Sind except at a very early stage.

Satara.—Attempts to introduce Eucalyptus in the Satara Range were started in the year 1929-30 in Bombala kurans which are bounded by irrigation channels on two sides. The majority of the transplants failed to establish themselves. The experiment is being finally tried in the ensuing year.

Shikarpur Division.—The seed of Anogeissus latifolia, Gmelina arborea, teak, Cassia fistula, Terminalia belerica, Anacardium occidentale, Thespesia populnea and sandal were sown in the Rahuja garden. All the seed except teak and sandalwood germinated, the seedlings of Anogeissus latifolia however died in the cold weather. The other seedlings are surviving and look healthy for the present. Further layering of bamboo was undertaken with very successful results.

Hyderabad (Sind) Division.—Seeds of three African Acacias collected in the Sudan and supplied by the Economic Botanist, Royal Botanic Garden, Kew, were sown in two localities (1) irrigated by well water and (2) irrigated by river spill in 1930. Some seed was treated with concentrated sulphuric acid before sowing. Untreated seed germinated just as well as the treated seed.

Germination with well water was 30 to 50 per cent. and in flooded areas 50 to 100 per cent.

Frost did not affect the seedlings irrigated with well water. In the flooded area up to 88 per cent. of the germinated seedlings were killed by frost. Seedlings from the treated seed stood frost better than the untreated seed but this appears to have been a mere coincidence.

Karachi Division.—Seeds of two species of African *babul* were sown in Kathar Range. The plants have attained 1′ 8″ to 2′ 8″ in height and are in healthy condition. The Chief Conservator does not consider that experiments with exotics in Sind are of much value from the practical forestry standpoint.

Experimental and Commercial Activities.

Kanara Northern Division supplied a sample shipment of 14 tons sawn teak followed by a second consignment of 19 tons, to Messrs. Rhodesian Timbers Limited, with a view to exploring the possibilities of a market for teak in South Africa. Up to the present, no further business has been done. A trial sample of Laurel (*matti*) planks was also sent to the same firm.

As a result of experiments by Mr. R. Davies, I.C.S., the sapwood of *dhamni* (Grewia tiliæfolia) has shown some promise of its suitability for golf shafts and a small local market for this timber now exists in Belgaum. Logs of *dhamni* have been supplied by Belgaum Division and mill cut roughs from Kanara Northern Division. Messrs. Dawson and Company of Bombay have also taken a sample for test for billiard cues.

Two logs of Artocarpus hirsuta and two logs of Adina cordifolia were supplied to the Forest Economist, Forest Research Institute, Dehra Dun, for test under Project VIII.

25,000 teakwood keys 8" and 75,000 of 10" were manufactured and supplied to the B. B. and C. I. Railway during the year.

Experimental Propagation of Lac.

Experimental propagation of lac was continued with encouraging results in Godhra and Halol Ranges of the Panch Mahals Division and Dharwar and Hangal Ranges of the Dharwar-Bijapur Division. In the Mandvi Range of the Surat Division the result obtained was not bad even though in one plot the brood lac was washed away by heavy rains in October and much damage was caused by a fire which broke out subsequently in the area. In other localities the results were very poor.

Hitherto the results which hold out any promise of ultimate success are obtained on *palas* (Butea frondosa) and *ber* (Zizyphus Jujuba). Propagation work will be confined to these species using brood lac obtained from the same species.

Lac propagation experiments were also started during the year in the Satara Division in Patan and Satara Ranges where the locality appeared suitable for the production of lac. In the former range the brood lac was washed away on account of excessive rains, whereas in the latter, although the swarming was good, the lac insects did not flourish.

In Miani and Manjhand Ranges of the Hyderabad Division (Sind) 64 *babul* and 50 *ber* trees were inoculated. No collection of lac was made during the year as it was considered that, after the serious damage lac had suffered in the 1929 frost, it required complete and prolonged rest for re-establishment.

CHAPTER VII.

ADMINISTRATION.

The office of the Chief Conservator of Forests was held by

Mr. H. L. Newman, C.I.E., from 1st April 1930 to 30th April 1930 and from 22nd November 1930 to 31st March 1931.

Mr. P. E. Aitchison from 1st May 1930 to 21st November 1930.

The territorial Circles were held by the following officers :—

Northern Circle	.. Mr. A. C. Hiley from 1st April 1930 to 6th April 1930.
	Mr. H. W. Starte from 7th April 1930 to 13th December 1930.
	Mr. R. W. Inder from 14th December 1930 to 31st March 1931.
Central Circle	.. Mr. C. E. L. Gilbert from 1st April 1930 to 8th April 1930.
	Mr. A. C. Hiley from 9th April 1930 to 31st March 1931.
Southern Circle	.. Mr. P. E. Aitchison from 1st April 1930 to 28th April 1930 and from 24th November 1930 to 23rd February 1931.
	Mr. D. B. Sothers from 29th April 1930 to 23rd November 1930 and from 24th February 1931 to 31st March 1931.

Sind Circle .. Mr. R. W. Inder from 1st April 1930 to 13th April 1930.

Mr. C. E. L. Gilbert from 14th April 1930 to 31st March 1931.

Mr. R. V. Alexander held charge of the office of the Forest Engineer, Southern Division, throughout the year.

Divisional charges were held by officers named below :—

Division	Name of officer	From	To
Panch Mahals ..	Mr. R. F. Sandeman.	Throughout the year.	
Surat ..	Mr. E. O. Sampson ..	Throughout the year.	
North Thana ..	Mr. W.C. DeC.Walsh.	Throughout the year.	
East Thana	Mr. E. T. C. Vas ..	1st April 1930 ..	2nd April 1930.
	Rao Saheb G. R. Patkar.	3rd April 1930 ..	31st March 1931.
West Thana	Mr. R. A. Shirali ..	1st April 1930 ..	14th December 1930.
	Mr. H. W. Starte ..	15th December 1930 ..	26th January 1931.
	Mr. R. A. Shirali ..	27th January 1931 ..	31st March 1931.
East Nasik ..	Mr. R. K. Kanitkar ..	Throughout the year.	
West Nasik	Mr. H. P. W. Davis ..	1st April 1930 ..	8th February 1931.
	Mr. S. P. Pandya ..	9th February 1931 ..	31st March 1931.
Working Plans, Northern Circle.	Mr. J. Petty ..	Throughout the year.	
East Khandesh ..	Mr. J. L. Bell ..	Throughout the year.	
North Khandesh	Mr. N. C. Ramchandani.	Throughout the year.	
West Khandesh ..	Mr. H. C. Holmes ..	Throughout the year.	
Poona	Mr. G. S. Singh ..	1st April 1930 ..	4th February 1931.
	Mr. E. A. Garland ..	5th February 1931 ..	4th March 1931.
	Mr. G. S. Singh ..	5th March 1931 ..	31st March 1931.
Kolaba	Mr. Abdul Rahim ..	1st April 1930 ..	5th April 1930.
	Mr. E. T. C. Vas ..	6th April 1930 ..	31st March 1931.
Satara	Mr. J. A. Singh ..	1st April 1930 ..	29th November 1930.
	Mr. E. A. Garland ..	30th November 1930.	2nd January 1931.
	Mr. J. A. Singh ..	3rd January 1931 ..	31st March 1931.
Working Plans, Central Circle.	Mr. E. A. Garland ..	Throughout the year.	
Kanara N. D. ..	Mr. S. N. J. Ratnagar.	Throughout the year.	
Kanara E. D.	Mr. J. Walker ..	1st April 1930 ..	19th January 1931.
		11th February 1931.	31st March 1931.
	Mr. D. V. Phatak ..	20th January 1931 ..	10th February 1931.
Kanara S. D. ..	Mr. Y. R. Divekar ..	Throughout the year.	
Kanara W. D. ..	Mr. H. J. C. Millett ..	Throughout the year.	
Kanara C. D. ..	Mr. F. A. B. Coelho.	1st April 1930 ..	31st October 1930 and from 1st November 1930 this Division was abolished.
Belgaum	Mr. E. S. B. Tavener.	1st April 1930 ..	6th November 1930.
	Mr. D. B. Sothers ..	7th November 1930.	23rd February 1931.
	Mr. F. A. B. Coelho ..	24th February 1931.	31st March 1931.
Dharwar-Bijapur	Mr. R. J. Smith ..	Throughout the year.	
Working Plans, Southern Circle.	Mr. S. N. Kesarcodi.	Throughout the year.	
Sukkur ..	Mr. A. F. Gonsalves	Throughout the year.	
Shikarpur	Mr. A. F. Gonsalves	1st April 1930 ..	15th May 1930.
	Mr. P. J. Rodrigues	16th May 1930 ..	31st March 1931.
Larkana ..	Mr. M. L. Khanna ..	Throughout the year.	
Hyderabad ..	Mr. R. P. Dalley ..	Throughout the year.	
Karachi ..	Mr. J. B. T. Brooks	Throughout the year.	

There were as usual some changes among Divisional Forest Officers chiefly owing to absence of officers on leave. Eight out of 28 Divisions

consequently changed hands during the year. Thirteen Divisions were held wholly by Imperial Officers, 6 wholly by Officers of Class I, 4 wholly by officers of Class II of the Bombay Forest Service, and 5 partly by Imperial officers and partly by officers of Classes I and II of the Bombay Forest Service.

The number of officers attached to Divisions as Assistants to Divisional Forest Officers or Sub-Divisional Forest Officers was 13, of whom 2 were of Class I and 11 of Class II of the Bombay Forest Service.

Subordinate and Clerical Establishments.

Five Ranger students completed their training at the Madras Forest College at Coimbatore and joined service during the year. Of these 5 students, 4 passed with Higher Standard certificates and 1 passed with Lower Standard certificate. Five new Ranger recruits were selected for the course of 1931–33 at that College during the year.

As a measure of economy no Forest Class was held in the Northern Circle during the year. Training classes for young Foresters and Guards under selected Rangers were, however, continued in the Southern Circle and out of 10 subordinates deputed during the year 8 passed out successfully.

Casualties and Punishments.

Particulars	General Direction	Northern Circle	Central Circle	Southern Circle	Sind Circle	Total 1930-31	Total 1929-30
1. Retirements ..	..	23	24	17	4	68	56
2. Deaths ..	..	8	8	10	6	32	47
3. Resignations ..	..	16	8	7	7	38	35
4. Prosecutions ..	..	..	..	..	2	2	4
5. Degradations ..	..	3	9	3	10	25	55
6. Dismissals, Removals, etc.	..	12	10	11	7	40	52
Total of 1930-31 ..	..	62	59	48	36	205	..
Total of 1929-30 ..	1	67	65	76	40	..	249

The health of the Forest staff was on the whole fairly good. The staff of North Thana, Surat Dangs, and Peint of the West Nasik Division suffered as usual from malaria. A special medical officer was engaged for the Haste saw mill from 2nd November 1930 to 31st March 1931.

Two cases in which Forest guards were prosecuted for misappropriation of Government money in the East Khandesh Division were decided and the guards were acquitted.

The two prosecution cases, one against the Nandurbar Range office clerk and the other against a late head clerk in the Kolaba Division, are still on the files of the Magistrates as the whereabouts of these persons are not yet traced.

One Forester in the West Nasik Division was prosecuted by a villager under section 506 of the Indian Penal Code. The case resulted in the acquittal of the Forester.

For the Protective staff the year under report was a very troublesome one, and much difficulty, arising out of the activities of the Civil Disobedience Movement, was successfully surmounted. The whole staff deserves to be congratulated on the splendid loyalty shown by it throughout this uncertain time.

The regular work of the Rangers and other subordinate protective and office establishments is reported, with few exceptions, to be satisfactory. The Conservators of Forests, Northern, Central and Sind Circles, have made special mention of certain Rangers and clerks for their good work.

The Conservator of Forests, Northern Circle, reports that recruitment of suitable candidates for guards' posts presents difficulty in the West Thana Division, particularly in the Kalyan and Salsette Ranges which are near Bombay and the Great Indian Peninsula Railway where the rates for ordinary labour are high. Candidates who take up appointments do not stick to the work, and frequent changes cause dislocation of work. There is more or less a general complaint in the Northern Circle that the starting rate of Rs. 15 is too low to attract the right type of men for guards' posts, a matter which unfortunately does not admit of remedy at present.

Inspection and Tours.

The Chief Conservator toured in all the four Circles of the Presidency. The Divisional and other offices were inspected by the Conservators as usual during the year. No serious irregularities were noticed.

Civil Suits.

The Civil suit filed by the Khot of Tise in the Kolaba Division is pending decision of the High Court on the appeal preferred by him.

Kanara Northern Division.—The two suits pending in the Court were decided during the year as under :—

(1) Suit filed by Mr. Isloor was decided awarding a decree of Rs. 506-12-0 in favour of the plaintiff against Rs. 1,677-8-0 claimed by him. An appeal against this order has been preferred as sanctioned by Government and is still pending.

(2) Suit filed by Mr. Sidlingapa Babladi against the Department was decided in favour of the plaintiff. In the appeal heard by the District Judge, Dharwar, the decree of the lower Court was set aside and the suit was dismissed with costs.

Kanara Eastern Division.—The civil suit pending at the close of the previous year was decided partly in favour of, but principally against Government. The amount involved is about Rs. 3,000 and the Legal Remembrancer to Government has recommended an appeal being preferred.

Kanara Southern Division.—Out of the 8 appeals referred to last year, 3 were decided during the year, all in favour of Government. The amount involved in the 3 appeals made by the Department is in the aggregate Rs. 11,475.

Belgaum Division.—The two suits which remained undisposed of at the close of the previous year are still pending in the Courts.

Shikarpur Division (Sind Circle).—A coupe contractor filed a civil suit praying for a decree for Rs. 1,200 in connection with some fuel sold by the Department from the coupe on expiry of the contract period. Incidentally the plaintiff has also claimed damages of Rs. 200 from the Forest Department for the loss alleged to be sustained by him. The defence of the suit has been sanctioned by Government and the case still remains undecided.

Land Revenue Administration.

The Divisional Forest Officer, Surat, continued to be *ex-officio* Assistant Political Agent, Dangs. He also functions as *ex-officio* Executive Engineer, Dangs, in regard to the buildings transferred to the Public Works Department.

The Divisional Forest Officer, West Nasik, continued to be in charge of the land revenue administration of the Peint Taluka and Wavar Mahal of the Thana District and also in charge of the Excise administration of Peint Taluka. The Divisional Forest Officer, North Thana, continued to be the Assistant Collector of the three Forest Mahals—Saiwan, Bapgaon and Sawa. The question of retransferring the above four Mahals to the Revenue Department for reasons reported last year is still pending.

The Revenue management by the Forest Department of the seven villages in the East Khandesh Division was continued satisfactorily.

The Revenue and Excise Administration of the Akrani Mahal was managed by the Forest Department with the Range Forest Officer as Mahalkari.

The Raisingpur Estate was as usual managed by the Forest Department under the Court of Wards, a Forester being in charge throughout the year.

The three Forest Mahals of Dandeli, Kulgi and Virnoli in Kanara Northern Division and two Mahals of Bilki and Kirwatti in Kanara Eastern Division continued to be under the administration of the Range Forest Officers as *ex-officio* Mahalkaries, the Divisional Forest Officers being *ex-officio* Assistant Collectors. There was no trouble with the people and their relations with the Department were entirely satisfactory.

Kumries.—In Belgaum Division the majority of the kumri villages were visited by the Divisional Forest Officer. Kumri villagers out of habit, rather than real need, invariably ask for more kumri lands,

but apart from this, they appeared to be contented and as prospercus as their methods of tillage permit. Proposals for disforestment of kumri lands are awaiting sanction of Government.

Village Panchayats.—At the commencement of the year 15 panchayats were in existence comprising 25 villages. During the year two new panchayats comprising 5 villages were formed. Out of the 17 panchayat forests, 13 are situated in Kanara Southern Division. The amalgamation of the Kanara Coast Division with Kanara Southern Division has given the Divisional Forest Officer of the latter Division, Mr. Y. R. Divekar, an opportunity to inspect the minor forests of the coast in some detail and his report on their condition is far from satisfactory. He states that the cutting privilege is universally abused; that the most promising poles are cut first, stumps are left from one foot to four feet high, much more timber than is necessary is felled, and the surplus is left behind to rot or form a supply of "dead wood" for use later as fuel. As a result he is of opinion that the "privileges", as at present exercised, are leading to the more or less rapid, but sure, destruction of the Coastal forests.

Departmental control of these abuses is out of the question, for even a very largely increased staff could effect very little without the co-operation of the villagers concerned. For these reasons therefore Mr. Divekar's remarks on the Panchayat Forests are of interest and are quoted below in full:—

"All the Panchayats are under the control of the Revenue Department, with the Mamlatdars directly in touch and responsible for seeing that the accounts are properly maintained. It is reported that during the year few Panchayats showed any activity in the matter of planting new trees, clearing grazing grounds of thorny growth and generally improving the Panchayat Forests; while in most, grazing fees remained unrecovered. This is attributed to the influence of the Civil Disobedience Movement. The same influence is understood to be responsible for the absence of demand for any more panchayats at present. On the whole, thanks to the Civil Disobedience Movement, the Panchayats seem to have had a set-back; no new work was done except the clearing of 6, 10 and 6 acres of thorny growth in Shetgeri, Chitrige and Halkar respectively; the revenue, consisting mainly of grazing fees, appears to have greatly diminished owing to non-payment of grazing fees; and though the existing forest growth is reported to have been duly preserved and protected it appears that in more than one Panchayat there is no proper management (the Sar Panch in one case taking an honorarium of Rs. 20 in spite of the fact that the year's revenue was barely Rs. 8), while in two Panchayats there appears to be friction between members. Even the protection of the Panchayat forests cannot be considered to be a net gain since it is purchased at the expense of unrestrained destruction of more valuable minor forests, open to the Panchayats under Mr. Collins' group system. Thus while local patriotism spares the exhausted patches of forest land (which are mostly the present Panchayat forests), the more readily because there is hardly anything left

to cut to tempt the villager, the well-wooded interior forests thrown open under the Group system to the Panchayat village along with other villages receive no consideration and the Panchayat villager is as destructive in these more valuable forests as any non-Panchayat villager; the result is that while the improvement of the Panchayat Forests is problematic and in any case not likely to take place without sustained effort extending over a number of years, the destruction of the new minor forests is proceeding apace and they are on the high road to becoming what the Panchayat Forests are at present. This is the result which may well make it advisable to reconsider the policy with regard to the formation of new Panchayat Forests. That policy at present is based on the supposition that it is not safe to entrust to a Panchayat any forest which is at all valuable. Most of the existing Panchayats were accordingly formed with respect to bits of forest which *could not be maltreated further*. It is obviously difficult for the average villager to feel much pride in or enthusiasm for such forests and whatever earnestness or enthusiasm at present appears to exist is (it may be said) almost wholly artificial, owing its birth to a sense of *personal* importance felt by the Sarpanch and to a less extent by the other members of the Panch, in their office. To evoke enthusiasm and pride in the Village Forest, the Village Forest must be a valuable asset in the eye of the ordinary villager, which it is worth while jealously conserving and as far as possible improving for the benefit of his own village by excluding other villages and by making a sparing use of it for his own needs. As far as destruction and deterioration are concerned, a valuable bit of forest made into a Village Forest could hardly undergo more rapid deterioration and destruction than it does under the present exercise of privileges on the Group system. If the formation of Village Panchayat Forests, by evoking local pride and enthusiasm and the feeling of exclusive ownership, is likely to lead to the conservation and even improvement of the otherwise fast deteriorating minor forests of this District, it is far more important that the experiment should be tried in respect of valuable minor forests than in respect of those which are considered to be beyond the possibility of further maltreatment. Unless this is done it seems idle to hope to arrest the destruction that is overtaking most of the accessible minor forests of the Division. The present policy may give rise to more Panchayat forests, but by the time the process is complete all the valuable minor forests will have hopelessly deteriorated. The crying need of the hour is for better control of the privileges, and if this can be achieved by parcelling out the more valuable bits of minor forest among responsible Panchayats, the reversion to greater departmental control, which is bound to be very unpopular, can be avoided."

The picture drawn by the Divisional Forest Officer accurately represents the deplorable state of the coast forests, as personally verified by the Chief Conservator. The destructive methods characteristic of the coastal tract inhabitant, have merely been speeded up as the result of the generous scale of privileges conceded in recent years. The Chief Conservator approves Mr. Divekar's suggestion for allotting a few

of the more valuable minor forests to Panchayat charge, but it will be necessary to proceed with great caution in any steps taken on such lines. One thing is certain and that is that the freedom of action and the extent of concessions granted to the villagers, wisely or unwisely, in the Kanara Coast minor forests, render effective departmental control out of the question. Such control always was ineffective in the past in the forests within sight of the sea as proved by the fact that they are degraded beyond repair.

The relations between this Department and other Government Departments continued to be cordial as usual.

CHAPTER VIII.

GENERAL REMARKS.

Financially, for a department accustomed to show a steadily progressive revenue increase, the year under report is a first class disaster in its history. The general trade depression was reflected in the market for every kind of forest produce. The present timber stocks at Dandeli depot in Kanara Northern Division, the largest timber depot in the Presidency, are heavy and unlikely to be disposed of at other than low prices. The fuel market was particularly bad in the Southern Circle and there is little hope of its early recovery. Last year a rather large area of fuel forest was sold in the Belgaum Division and this fact coupled with a very poor demand for the outturn has led to a large accumulation of stocks which must have an adverse effect on future sales of fuel areas. The depression was further very greatly accentuated in the Presidency proper by the activities of the Civil Disobedience Movement, the result being that a large quantity of timber and a large number of coupes, etc., which normally would have been sold, even though at lower rates than usual, remained wholly undisposed of. The loss of revenue by non-sale of coupes and by reduced prices realised for such coupes as were sold, amounts approximately to Rs. 9,50,000 in the Thana District alone. Now however that the Civil Disobedience Movement and interference with the freedom of traders have come to an end, there are certainly indications of an improvement in sales and income, for the coming year.

Civil Disobedience Movement.—The effect of the Civil Disobedience Movement launched by the Indian National Congress on the Forest finances has been referred to above. Disobedience of forest laws assumed an aggressive, and on occasion a violent form in many parts of the Presidency. Mass meetings were held in various parts urging people (1) to cut trees and grass, (2) to graze cattle in closed forests, (3) to refuse to purchase coupes and grass kurans, (4) not to pay grazing fees and assessment on forest lands given out for cultivation, and (5) not to help Government servants in any way. The spirit of lawlessness was preached far and wide and everything done to create in the minds of the villagers the impression that forest laws could be broken with impunity. Mass "Satyagrahas" were organized at some places, and the leaders and their

followers, despite all attempts at control by the local Forest, Revenue and Police officers, entered the forest and committed one offence or another against the law. The movement was seen in its worst form in the East Nasik, Satara, Kolaba and Belgaum Divisions and the coastal talukas of the Kanara District, though other Divisions had their share of trouble. In the East Nasik Division the normal strength of the forest staff had temporarily to be supplemented by drafting men from the quieter parts. At Belashi in the Satara District and at Chirner in the Kolaba District the Police were forced to open fire on the crowd and in the struggle at the latter place the Mamlatdar of Panvel and a Round Forest Guard, Mr. K. J. Shewde, lost their lives. The movement in Belgaum Division was more violent than elsewhere and opened with an organized raid on the Nandikalli forest by 200 villagers of Ankalgi who took their carts with them. 805 trees were felled and removed. Other cuttings on a large scale were carried out in Gokak and Gujnal Ranges. A mob of villagers at Aktangerhal in the latter Range forcibly rescued some of the village cattle which were being taken to the pound by the local staff assisted by friendly Berads. The staff and Berads were assaulted with some violence. The trouble began to subside when active and vigorous measures were taken by Mr. Tavener, the Divisional Forest Officer, with the co-operation of the Revenue and Police authorities, and by the end of September the situation was normal. In this connection the Collector of Belgaum makes the following remarks :—

" The Collector feels that he must express his admiration for the way in which the officers and subordinates of the Forest Department kept their heads during the Civil Disobedience Movement. It might have been expected that a service which is generally attacked as the most obnoxious to the Rayat in this Presidency would have been affected with some degree of panic at the outbreak of mass Civil Disobedience along with organized forest ' satyagraha '. Nothing could be further from the fact. The subordinates turned their whole attention to the guarding of forest produce ; the Range Forest Officers did some most valuable propaganda work against the movement ; and Mr. Tavener, the then Divisional Forest Officer, preserved an admirable equilibrium of tact and firmness, which in fact triumphantly broke down the propaganda of forest ' satyagraha ' in the District. When the Divisional Forest Officer was about to depart on leave, two of the leading congressmen of Manoli (a village where the anti-grazing fee campaign had been particularly virulent) came into his office and emptied a bag of rupees upon the table ; saying that they could not allow him to leave the District without paying up the arrears of the Manoli grazing fees for which, in negotiation, they had made themselves responsible."

The leaders of the movement and the more forward agitators everywhere were promptly dealt with under the Law. Strenuous efforts on the part of all District officers and steadfast loyalty and co-operation amongst the subordinates gradually assumed control of the movement and some time before the truce was called the conditions in the forest tracts were almost normal.

In an otherwise unsatisfactory year it is pleasant to note that the Madras and Southern Mahratta Railway returned to direct dealings with this Department for the supply of sleepers. A contract for supply of sleepers from 1931-32 has been secured, the number to be supplied being 1,00,000 first class and 10,000 second class sleepers every year at a price of Rs. 3-8-0 and Rs. 2-8-0 respectively.

Thana Gurcharans.—The Gurcharan Officer inspected the important gurcharan lands in the Palghar, Dahanu, Umbergaon, Wada, Shahapur, Kalyan, Bhiwandi and Murbad talukas and selected areas for modified clear fellings. The areas selected comprise a large number of gurcharans where grazing is of primary importance and *tahal* is not much in demand. He also carried on educative work, explaining to the villagers the existing privileges which they could freely enjoy in reserved forest and gurcharans and also gave tahal demonstrations. The importance of conserving tahal producing trees in malki lands was also explained.

Khairanpatti forests.—The proposal made by the Collector of Thana for the conversion of the reserved forest of Kairanpatti measuring 1259 acres into protected forest and for its transfer to the control of the Revenue Department was sanctioned by Government during the year. The actual transfer awaits clearance of the valuable growth from the area.

Forest Advisory Committees.—In the Northern Circle two meetings were held in Thana and two in Nasik. One meeting was to be held in the Panch Mahals but as the non-official members did not attend, the meeting was abandoned. At the first meeting held at Thana, the subjects proposed for discussion were outside the scope of the Committee and were not discussed. The Divisional Forest Officers, North Thana and West Nasik, explained the forest point of view for fixing a shorter rotation for the exploitation of teak trees from occupied lands. They also explained why malki teak trees in Mokhada Petha cannot be sold for a nominal price with the right to after-growth as suggested by one of the non-official members. The second meeting at Thana was not attended by the non-official members and consequently terminated without transacting any business. There were no subjects for discussion at the first meeting at Nasik and at the second meeting the rule relating to the levy of fees on village cattle in forest villages and some other minor grievances were discussed.

In the Central Circle two meetings were held in the Khandesh and Kolaba Districts. The subjects discussed were not of a very important nature. The very few grievances brought forward such as the inconvenience caused to people in the issue of permits for minor forest produce, etc., were remedied.

In the Southern Circle both the Kanara and Dharwar Forest Advisory Committees held two meetings during the year. No points of interest are reported to have been raised.

The Conservator of Forests, Northern Circle, remarks that, though the committees supply an adequate means for the department to explain its policy and the principles of forest management, it is doubtful whether they justify their existence as members usually bring up matters which are beyond the scope of the committee to discuss and what few grievances are ventilated through the non-official members have, as a rule, been dealt with by the local officials in direct communication with the people concerned.

Forest Cultivation and Forest Settlements.—Rs. 22,980 were realised as assessment for the forest areas given out for cultivation in the Northern Circle. As a result of the propaganda carried on by the Congress, a few settlers in the Panch Mahals Division tried to non-co-operate with this Department and refused to render assistance in carrying out silvicultural operations. Notices had therefore to be served terminating their leases but the settlers eventually took a more sensible view of things and the leases were renewed. The general condition of the Settlements was otherwise satisfactory.

The inforest settlements in the three Khandesh Divisions are in a good condition. New settlements were opened at Rajdehar, Junpani and Chapaner in the East Khandesh Division and at Begali, Nave Ban, Kansi, Lakdya Hanuman and Langdi Bhawani in the North Khandesh Division. Some of the old settlements were extended with a view to providing economic plots to existing khatedars. The crops in the settlements were good. In a few cases the settlers were allowed to cut and sell bamboos at concession rates.

Atnavar-Dandeli Railway.—The revenue and expenditure of this Railway for the two years 1930-31 and 1929-30 compare as follows :—

Year.	Receipts.	Expenditure.	Surplus or deficit.
	Rs.	Rs.	Rs.
1930-31 ..	43,069	43,835	—766
1929-30 ..	40,938	45,766	—4,828
Difference ..	+2,131	—1,931	+4,062

Though there was still a small deficit, the financial result is encouraging and shows an increase in receipts and decrease in expenditure as compared with the previous year.

The nine year monopoly grass contract terminated in May 1930 and there was no fresh supply of grass made during the year. Attempts were made to dispose of the stock on hand at the storage depôts at Godhra, Dohad and Palghar. No reasonable offers were received at the first two depôts. A small quantity, viz., 1,17,210 lbs. from the Godhra depôt and 4,000 lbs. from Dohad depôt, was, however, sold locally for Rs. 1,434. Every effort is being made to dispose of the balance in the

Panch Mahals, especially the stocks which are 5 years old. Two offers were accepted for the Palghar grass, one for 30 lakhs lbs. at Rs. 7-9-0 per 1,000 lbs. and the other for 81½ lakhs lbs. at Rs. 8-3-0. The recoveries made during the year amounted to Rs. 750. The quantity of grass on hand at the close of the year at the three depôts mentioned above was 33,170,065 lbs.

Large breaches occurred in certain Bunds in the Shikarpur and Larkana Divisions in Sind causing serious damage to dwellings in numerous villages and necessitating large grants of timber being given free to poor people to rebuild their houses. As a result of the floods the guards' quarters and an Inspection Bungalow in the Kot-Sultan and Ghari Yasin forests collapsed completely.

On account of failure of some of the Rabi and Kharif crops in Sind combined with the fall in prices of cereals, generous remissions in the assessment to the extent of Rs. 19,286 were granted by this Department.

As permitted by Government, Mr. C. E. L. Gilbert, Conservator of Forests, Sind Circle, accompanied by Mr. C. G. Abichandani, Sub-Divisional Forest Officer, Hyderabad, paid a visit to the Punjab in October 1930 with a view (1) to studying the various problems connected with the creation and management of irrigated forest plantations there and (2) to the subsequent application of the knowledge so gained in framing plans for similar plantations in Sind. Accordingly these officers studied the work in the four Punjab plantations of Khanewal, Chichawatni, Arifwalla and Changa Manga. The Conservator reports that the experience gained by this visit has convinced him that there is no doubt that, given adequate irrigation facilities, irrigated fuel plantations in Sind will not only be possible but will, in course of time, prove exceedingly profitable.

After prolonged discussion and correspondence with the Public Works Department authorities in Sind an arrangement has been arrived at under which some 10,000 acres of inland forests in the Larkana Division are to receive an assured supply of water amounting to a Delta of 3′ 6″ per annum during the kharif season from the Barrage Canals. This arrangement involves preparation by the Public Works Department of schemes for the alignment and construction of distributary channels at an approximate cost of Rs. 2-8-0 per acre, the total cost of Rs. 25,000 being repaid in instalments spread over 20 years or less. The full water supply for 10,000 acres will be worked up to gradually by 5 annually increasing instalments, on payment (at Rs. 3 per acre) of Rs. 6,000 for the first year, Rs. 12,000 for the second year, and so on rising to Rs. 30,000 in the fifth year. During this preliminary five year period the area to be dealt with will be gradually cleared and cultivated with field crops as a means both of securing revenue and of proper preparation of the soil subsequently to be brought under tree-growth.

Since the close of the year Government have ordered the preliminary steps to be taken with a view to the formation of these irrigated plantations.

Reference has already been made to the loyal attitude of all ranks during a year of most trying circumstances. In closing this review the Chief Conservator desires to record his deep appreciation of the devotion to duty exhibited throughout the Department down to its humblest servant, as also of the tactful handling of critical situations by those occupying positions of greater responsibility.

Remarks of Divisional Commissioners on Circle Reports are printed below :—

Commissioner in Sind (Mr. R. E. Gibson, C.I.E., I.C.S.):

"The Commissioner in Sind has the honour to state that he has no remarks to offer on the Annual Administration Report of the Sind Forest Circle, for the year 1930-31, received with letter No. 16-2300, dated the 28th August 1931, from the Conservator of Forests, Sind Circle."

Commissioner, Northern Division (Mr. J. H. Garrett, I.C.S.):

"The Gurcharan Officer, Thana, inspected important Gurcharans during the year and has submitted to Government draft notifications for conversion of part of the sanctioned area of Gurcharans into Reserved Forest.

2. The total number of forest offences decreased from 7,001 to 6,349, the fall being chiefly noticeable in the North Thana Division due to poor patrolling by the staff which was busy with regeneration and other forest work. In 1,378 cases offenders could not be detected, in 140 cases they were let off with a warning, 4,903 cases were compounded recovering Rs. 24,800 as compensation in 4,763 cases—167 new cases were taken to court. 148 cases including 30 of the previous year were disposed of during the year of which 137 ended in convictions. The number of fires decreased from 903 to 800 chiefly due to allowing the concession of cutting and removing grass to villagers in the West Thana Division and to the prompt help given by these villagers in putting out fires. In the Mandvi range fire protection continued to be bad in spite of warnings and in some cases fires were started under the instigation of the non-co-operation agitators.

Rewards amounting to Rs. 551-6-0 were given to Patels and others for help in forest protection in the Dangs.

3. Grazing fees amounted to Rs. 77,097 as against 94,289 in the previous year, the decrease being due partly to the cattle epidemic in the Panch Mahals and to the Civil Disobedience Movement which prevented outsiders from taking advantage of grazing their cattle on payment. The decrease was greatest in the East Nasik Division.

The number of cattle impounded was 39,529 as against 30,606 in 1929-30 the increase being attributed mainly to the Civil Disobedience Movement under which the people tried to graze cattle without payment.

4. The total revenue from the working of the forests in the Northern Circle during the year fell from Rs. 28,02,552 to Rs. 13,91,513, i.e. by Rs. 14,11,039 while the expenditure fell from Rs. 12,33,603 to Rs. 11,24,149, i.e. by Rs. 1,09,454. The surplus thus amounted to Rs. 2,67,364 as

against Rs. 15,68,949 in 1929-30. The decrease in net revenue works out to Rs. 13,01,585 during the year. This heavy and unprecedented drop in revenue is reported to be due to the depression in the timber market and the Civil Disobedience Movement which did not help the sale of timber and coupes.

5. The expenditure on 'communications and buildings' under '52-A—Capital Outlay' decreased from Rs. 1,36,000 to Rs. 97,904 during the year under report.

6. Road construction in the Dangs showed good progress. More roads are still necessary in the Thana Divisions for the better exploitation of the forests.

The Civil Disobedience Movement had its effect in increasing the number of forest offences of illicit cutting and unauthorised grazing etc. and also in lessening the sale of coupes, timber and forest produce and thus had a share in decreasing the forest revenue of the year. It has however come to an end and the forest revenue may be expected to prosper again.

The year's work has been technically successful in spite of difficulties, but the financial results are very seriously affected. This feature overshadows the whole year."

Commissioner, Central Division (Mr. H. B. Clayton, C.I.E., I.C.S.):

"The following review of the Administration Reports of the Northern and Central Circles for 1930-31 in respect of the areas in the Central Division is forwarded to the Chief Conservator of Forests, Bombay Presidency, Poona, with reference to Government Resolutions, Revenue Department, No. 5542, dated the 31st May 1919, and No. 1110, dated the 19th April 1921.

Forest Areas.—There was a net decrease of 16·1 square miles as compared to 2·09 square miles in the preceding year in the forest areas owing to disforestments of lands for cultivation in Poona, Satara, Ahmednagar and Sholapur Districts in the Central Circle and some parts of the Northern Circle. There was a great demand for forest land for cultivation in North Khandesh and Satara Divisions from Mahars and other backward classes and also from agriculturists who have not sufficient land of their own. Such lands are not disforested but are given for annual cultivation on payment of the estimated assessment.

Forest Surveys.—No survey work was done during the year under report. The area remaining to be surveyed is 13 square miles of the Protected Forests in the West Nasik Division.

Management of State Forests.—The revised working plan for the Nasik scrub and teak pole jungles (East Nasik and West Nasik Divisions) is under preparation. The work of preparing the revised working plan for the Poona Division continued during the year. The following working plans were finally sanctioned by Government during the year :—

(1) Working Plan for the Umarpata Reserves (West Khandesh Division).

(2) Working Plan for the Taloda Reserves (North Khandesh Division).

The working plan for the Scrub and Jamner Teak reserves of the East Khandesh Division has been sanctioned by Government. The prescriptions of the working plans in force were carried out as far as possible. There was a smaller demand for coupes generally in all Divisions owing partly to continued trade depression, partly to poor growth in and inaccessibility of certain coupes and to some extent to the Civil Disobedience Movement. The forests which have been transferred for management to Revenue Department are looked after by the Revenue officers and village officers. In some districts, e.g. Sholapur, Forest guards have been appointed to look after the maintenance and care of trees, the collection of grazing fees and other details.

Communications and Buildings.

Roads and Bridges.—Unmetalled roads, 13 miles and 6⅓ furlongs in the East Khandesh Division and Dara-Dhadgaon road 2 miles of Section No. II in the North Khandesh Division, were constructed during the year. Repairs were also carried out on roads to the extent of 483 miles 6½ furlongs including a length of 135 miles of bridle paths in the Akrani and Taloda Ranges.

The total expenditure incurred was Rs. 14,820 on new works and Rs. 7,576 on repairs as against Rs. 20,492 and 7,854 respectively in the year 1929-30. The progress made with the construction of the Dara-Dhadgaon road was very satisfactory. The road has now been rendered motorable from Dara up to Dhadgaon. The Helwak-Kisrule road in the Satara Division was repaired from funds provided by the District Local Board, Satara, the net expenditure incurred being Rs. 80. The road has been transferred to the District Local Board under Government Resolution, Revenue Department, No. 7127/28, dated the 5th May 1931.

Buildings.—The total expenditure incurred on new works amounted to Rs. 2,254 as against Rs. 11,919 in the previous year. The expenditure on repair works was Rs. 4,567 as against Rs. 5,320 in the previous year. As stated in the last year's report the necessity for housing accommodation for the Forest subordinates was keenly felt particularly during the Civil Disobedience Movement. The social boycott that was organised during the rains of the year under report hit the Forest subordinates hard at several places, where, they had rented houses, the owners of which served them with notices to vacate their premises in spite of the inclemency of the weather.

Other works.—The expenditure incurred on wells and wire fencing was Rs. 779 as against Rs. 494 in the previous year. Repairs were carried out under this head at a cost of Rs. 91.

Protection of Forests.—The total number of offences during the year under report was 7,982 as against 8,440 in the previous year, a decrease of 458 offences. All Divisions except East Khandesh, West Nasik and Satara contributed to the decrease which was mainly under the heads 'unauthorized fellings' and 'other offences'. There was a slight increase in the total number of offences under the heads 'Injury by fire' and 'Grazing without permission'. In all cases it is to be feared that

the decrease was nominal rather than actual and was due to the staff being preoccupied with efforts to combat such activities as forest satyagraha and therefore unable to detect the commission of offences in other localities.

Injury by fire.—There was an increase of 85 offences under this head chiefly due to bad fires in the West Khandesh and Satara Divisions.

Unauthorized felling.—The deterrent punishments inflicted by the Magistrates on forest offenders involved in the non-co-operation movement and brisk patrolling by the staff are reported by the Divisional Forest Officer, East Nasik, to be the reasons for the decrease in the number of offences in his Division. It is true that there was a decrease in the total number of offences under this head, the increase in the East and North Khandesh and Satara Divisions being counterbalanced by a decrease in the West Khandesh and Poona Divisions. There appears however reason to believe that the decrease in the number recorded may have been due to faulty registration. The increase in the East Khandesh Division was due to illicit stripping of Anjan leaves and that in the Satara Division was due to the Civil Disobedience Movement.

Unauthorised grazing.—There was an increase in East and West Nasik Divisions and a slight increase in East Khandesh, Satara and Poona, due to deliberate grazing of cattle in closed coupes resorted to by some villagers in pursuance of the Congress propaganda.

Other offences.—There has been a marked decrease of 261 offences under this head in all the Divisions as against an increase of 371 during 1929-30.

Prosecutions.—In Central Circle out of the total number of 348 cases 228 were disposed of, out of which 96 ended in convictions : while 5,035 cases were compounded and brought in compensation amounting to Rs. 69,891.

Protection from fire.—The total area burnt during the fire season ending 31st May 1931 was 308 square miles as against 322 square miles in the previous year. There was a decrease all over the Circle except in the West Khandesh Division where the area burnt this year was about double the area burnt in the previous year. The Divisional Forest Officer is of opinion that the increase is due to the stoppage of communal punishment. The villagers who are generally privilege holders consider that they will not be punished as a community and put to any loss for bad fires in their jungles. Chinchpada and Pimpalner Ranges were responsible for the most extensive fires. It is obvious that many of the fires were deliberately started simultaneously in different places so that it was quite impossible to trace the offenders. As usual many of the fires were started intentionally to stimulate the growth of green grass and also for shikar. The total cost of fire protection was Rs. 9,346 as against Rs. 8,916 in the previous year.

Grazing fee.—The grazing fees collected during the year amounted to Rs. 77,097 in Northern Circle and Rs. 2,94,429 in Central Circle as against Rs. 94,289 and Rs. 3,45,054 respectively in the preceding year. The large decrease in the East Nasik Division was mainly due to the disturbed

state temporarily created by the Civil Disobedience Movement during the grazing season which deterred the owners of outside cattle and of cattle from non-forest villages from availing themselves of forest grazing. In Central Circle there was for a similar reason a fall in the total number of animals admitted to grazing. In the beginning people grazed their cattle without payment of fees. But when coercive measures were adopted fees at double rates were recovered. The villagers however did not pay for the full number of cattle as before. The decrease is also partly due to the small number of outside cattle that were brought for grazing in reserved forest in the East and North Khandesh Divisions owing to good rains and the consequent abundance of fodder.

Civil Disobedience Movement.—Forest Satyagraha :—

Forest Satyagraha, which was one of the activities of the Civil Disobedience Movement, was resorted to in the Districts of Ahmednagar, East Khandesh, West Khandesh, Nasik, Poona and Satara Districts. The Satyagrahis first selected Sangamner and Akola talukas in the Ahmednagar District for the commencement of their campaign owing to their reputation for defiance of law. They had issued pamphlets about the breaking of Forest Laws and encouraging such demands as free grazing and fuel cutting etc. in forests. As counter-propaganda the Director of Information issued leaflets on 'Forests' and 'Free Grazing'. The District Magistrate, East Khandesh, issued, for public information, a circular pointing out the necessity of having forest laws and advising the public not to be misguided by the mischievous propaganda of the Satyagrahis. Copies of this Circular were also sent to the Collector of Ahmednagar for distribution. Thus the agitators were defeated in their attempts by counter-propaganda carried out by Government.

In Ahmednagar District owing to the difficulties in collecting grazing fees through the subordinates of the Forest Department and in order to facilitate and expedite the collections it was arranged to collect the fees through the village officers and other Collectors were also asked to make similar arrangements in their respective districts.

Government in Government Resolution, Revenue Department, No. 5397/28, dated the 6th August 1930, authorised the Conservators of Forests to empower the village officers to issue the permits and to collect the revenue for minor forest produce and fixed the remuneration at 9 pies in the rupee.

The Collectors were asked to submit fortnightly reports showing the progress of collections of grazing fees and a Divisional statement was submitted to Government for information.

The date for the payment of grazing fees was extended to certain parts of the Ahmednagar District up to 30th September 1930.

At Bilashi, a village in Shirala Peta of the Satara District, matters assumed a serious aspect as the inhabitants of the adjoining villages cut one timber pole from the Reserved Forest and hoisted a Congress Flag thereon and erected it in the Court-yard of a temple. As the situation called for prompt measures, a special police party was sent for to restore peace and order, and successfully achieved this object.

In other Districts also some leaders were prosecuted for breach of the forest laws, and this had a salutary effect in checking the Forest Satyagraha movement."

Commissioner, Southern Division (Mr. W. W. Smart, I.C.S.) :

Kolaba Division.

"The total revenue fell from Rs. 1,91,071 to Rs. 1,29,933 and the expenditure from Rs. 1,41,870 to Rs. 1,40,060, the net deficit being Rs. 10,127. The fall in the revenue is ascribed to general trade depression and the Civil Disobedience Movement and the decrease in expenditure is due to smaller amounts paid on account of Khoti and Inam shares. Only Rs. 5,943-0-1 were paid to Khots as against Rs. 7,667-2-10 last year.

Forest offences show an increase of 31 over last year. The increase occurred under unauthorised felling and grazing and it is explained to be due to the Forest Satyagraha during the Civil Disobedience Movement. The Civil Disobedience Movement was also responsible for a fall of 13,831 in the number of cattle admitted to grazing. An area of 1½ acres out of the Casuarina plantation at Akshi and Nagaon was washed away by erosion.

It is satisfactory to note that cultivation in clear-felled coupes so long undertaken by Thakurs and Katkaris only is now being tried by some Marathas in Nagothna and Roha Ranges.

Thinning operations according to the prescriptions of the Working Plan were carried out in 71 coupes and they entailed a net loss of Rs. 558. In the interest of sylviculture, however, they cannot be abandoned. Sale of 26,452 Royalty trees in Malki Numbers realised Rs. 16,402. Free grants of teak timber valued at Rs. 11,828 were made during the year. The Collector states that if the intention of these grants is to help poor sufferers he sees no reason in principle to restrict their present limit, as free grants are generally made in necessitous cases only. The Commissioner agrees with the Collector's remarks.

The settlement of 1,713 acres of forest area is held over pending the decision of the appeal preferred by Sardar Biwalkar in the High Court.

The Conservator reiterates the necessity of housing accommodation for Forest subordinates. The Commissioner fully realises the hardships to which subordinate officers are subjected for want of suitable lodgings, especially during times of political upheavals, but doubts whether Government can find the required money for quarters of Government servants in the present days of financial stringency.

The Forest Advisory Committee held two meetings during the year. No subject of importance was discussed. Mr. S. V. Tilak, the non-official member of the Committee, has published a Marathi pamphlet explaining the privileges under the Tahal lopping rules, Grazing rules and the Woodland Code and the Collector has arranged to distribute copies thereof to Talathis with instructions to make the privileges widely known among the villagers. In the Collector's opinion the pamphlet is likely to be useful to officials as well as the public.

The administration has been generally satisfactory, but unfortunately it was marred by the Forest Satyagraha at Chirner which compelled the Police to open fire on defiant and violent mob and culminated in the regrettable death of Mr. Joshi, the Mamlatdar of Panvel, and of a Round Guard, who died while doing their duty."

Southern Circle.

"The gross revenue decreased from Rs. 32,98,598 in 1929-30 to Rs. 23,72,805 in the year under report, while expenditure increased from Rs. 17,77,116 to Rs. 17,90,995. The net result is that the surplus fell from Rs. 15,21,482 to Rs. 5,81,810 which means a drop of Rs. 9,39,672. The decrease occurred in all divisions except Kanara W. D. and it is attributed to paucity of demand for timber and to the general trade depression. In Kanara S. D. these general conditions were aggravated by the boycott of timber sale at Hattikeri and want of demand for Tali palms on account of the fall in prices of ragi and rice. The increase in expenditure mainly occurred in Kanara N. D. and E. D. and is explained by the greater quantity of departmental extraction of timber and in the Dharwar-Bijapur Division by the larger quantity of sandalwood prepared.

2. The number of forest offences shows a decrease of 263. The Conservator states that the decrease is more apparent than real as the figures deal with *reported* cases only as against offences *actually committed.* The Civil Disobedience Movement which fostered disrespect for law and order among the villagers must have led to the commission of offences without fear of detection as the staff was fully engaged in combating the abnormal situation and guarding forests from mass attacks. That the staff did not receive the usual assistance from villagers in detection work must naturally have increased the number of undetected offences. Offences of forest fires rose by 51 while those under unauthorised felling, grazing and others declined by 314. The decrease is chiefly shared by Kanara W. D., C. D. and the Belgaum Division. Kanara S. D. was responsible for an abnormal increase of 306 offences under unauthorised fellings and forest fires. It was here that the evil effects of the Civil Disobedience Movement were most conspicuous. Out of 530 cases of forest fires during the year, 517 remained undetected. 12 were compounded and in one prosecution was resorted to but ended in the acquittal of the accused. The number of cattle admitted to grazing was 383,782 as against 478,488 during 1929-30 which gives a decrease of 94,706 which mainly occurred in all divisions except Kanara N. D. and W. D. There may be other less important factors contributing to this decrease but the main reason was the Civil Disobedience Movement which encouraged villagers to graze their cattle in forests without obtaining passes; this was particularly the case in Kanara S. D.

3. The number of cattle impoundings rose from 10,453 in 1929-30 to 10,951 during the year under report. Dharwar-Bijapur Division

alone was responsible for an increase of 1,222 and this is ascribed partly to the tendency of non-payment of grazing fees and partly to prolonged drought in certain parts.

4. The net profit of the Dandeli Saw Mill declined from Rs. 1,23,623-5-1 during 1929-30 to Rs. 73,153-13-3 during the year under report and is chiefly attributable to the fall in prices. The income of the Foden Saw Mill at Bomanalli fell from Rs. 30,690 to Rs. 14,812 because of the fact that while last year's stock on hand was valued at the then selling price, this year's stock was valued at cost price as instructed by the Audit Department. The net profit of the Kirwatti Saw Mill fell by Rs. 2,990.

5. Two new village panchayats were formed during the year—total number now is 17. It is reported that although the villagers protect their own panchayat forests, they do not show any concern for privileges in the neighbouring minor coast forests. These forests are recklessly hacked and much valuable material is wasted. The result is detrimental to forest conservancy and if this continues permanent destruction of the forest area open to privileges is certain.

6. The cart depôt at Kirwatti has been abolished with effect from 1st April 1931 as it was found to be a losing concern and as the necessity for its retention had ceased—motor buses are now easily available for the transport of touring officers and their kit.

7. The financial results of the working of the Alnawar-Dandeli railway show some improvement. The receipts increased from Rs. 40,938 in 1929-30 to Rs. 43,069 in 1930-31 while the expenditure decreased from Rs. 45,766 to Rs. 43,835. The net result however shows a small deficit of Rs. 768.

8. The revenue administration of the five forest mahals in Kanara continued to be satisfactory.

9. The year's working is gratifying despite the impediments created by the Civil Disobedience Movement. The Forest Department with its far flung boundaries and depleted staff though singularly vulnerable to mass attacks came out very well. The forest produce was well guarded, the Range Forest Officers did valuable propaganda work and saved a situation that might have easily become intolerable. That the Chirner tragedy was not enacted elsewhere is wholly due to the sangfroid of Government officers and not to the lack of any provocation on the part of Congress leaders and their dupes. The Commissioner fully endorses the Collector's commendation of Mr. Tavener's admirable tact and the firmness with which he handled the situation and put down the Forest Satyagraha movement in the Belgaum Division. He thus helped to check its spread elsewhere. Forest Satyagraha cuttings were also organised in Sirsi and Siddapur talukas and in the coastal area of the Kanara District and on a smaller scale in Bijapur. Although the monetary value of damage caused to forest was small the spirit of lawlessness engendered by these attacks is pernicious and will take some time to disappear.

10. The Department should be congratulated on its contract with the M. & S. M. Railway for the supply of metre gauge sleepers for three years commencing from 1931-32.

11. The cordial relations between the Revenue Department and the Forest Department were maintained."

H. L. NEWMAN,
Chief Conservator of Forests,
Bombay Presidency.

Poona, 10th October 1931.

Report.

Forest Department.

Administration — of, in Bombay Presidency, including Sind, for the year 1930-31.

GOVERNMENT OF BOMBAY.

REVENUE DEPARTMENT.

Resolution No. P. 57/2433.

Bombay Castle, 4th April 1932.

Letter from the Chief Conservator of Forests (Mr. H. L. Newman, C.I.E.) No. 2/1874, dated the 10th October 1931—Submitting the Forest Administration Report of the Bombay Presidency, including Sind, for the year 1930-31.

RESOLUTION.—The year under report has been financially the most unsatisfactory during the last decade. The gross revenue for the year was Rs. 52,24,000 as against Rs. 79,73,000 during 1929-30 and Rs. 72,95,000, the average for the years 1920-21 to 1929-30. The surplus for the year was Rs. 9,78,000 as against Rs. 36,63,000 during 1929-30 and Rs. 29,74,000, the average for the years 1920-21 to 1929-30. With acute depression prevailing in the timber trade, a considerable drop in profits was only to be expected. The fact that it reached such very large dimensions must be attributed to some extent to the campaign of civil disobedience launched by the Congress, during which sales were picketed and merchants threatened with boycott. As a result of the acute depression, aggravated by the efforts of the Congress, general conditions were rendered so disturbed that contractors were unwilling to face the resulting uncertainty and increased risks, and this restriction of business naturally led to an unprecedented drop in profits.

2. The number of offences registered during the year was 20,294 as against 21,530 during 1929-30 and 21,124 during 1928-29. This decrease is, however, more apparent than real. During the civil disobedience movement mass meetings were held at various places at which people were incited to cut trees and grass, to graze cattle in closed forests and to refuse assistance to forest officers. As a result, a large number of offences were committed in mass, and the forest staff was too busy combating this abnormal situation to register and tabulate all the offences. The movement was seen in its worst form in Nasik, Satara, Belgaum and the coastal tracts of Kanara. At Chirner in Kolaba District, the defiance of law assumed a violent turn, the police were compelled to open fire and, in the course of the struggle, the Mamlatdar and the Round Forest Officer lost their lives.

3. In spite of the preoccupations created by the civil disobedience movement, the normal work of the department was on the whole carried out satisfactorily. Construction work was in progress on 100 miles of new roads, repairs were carried out on 1,452 miles of old roads and Rs. 53,673 were spent on forest buildings. Silvicultural operations also showed steady progress all round. The layout of the Dandeli saw-mill was revised and modern plant installed. The department obtained a very satisfactory contract with the Madras and Southern Maratha Railway for the supply of metre gauge sleepers for 3 years.

4. The value of the major and minor produce removed by purchasers amounted to Rs. 19,38,000 and Rs. 9,40,000, respectively, as against Rs. 36,57,000 and Rs. 12,28,000 in the preceding year. Major and minor produce removed by concessionists and free grantees amounted to Rs. 11,71,000 as against Rs. 11,57,000.

5. The number of cattle admitted to grazing was 21,51,000 of which 6,14,500 were allowed free, the corresponding numbers for the previous year being 24,51,000 and 5,34,000, respectively. The collection of grazing fees fell from Rs. 5,72,000 to Rs. 4,93,000.

6. Government desire to acknowledge the tact and firmness displayed by the officers of the department during the exceptionally trying circumstances of the year. As this is the last report to be submitted by Mr. Newman, their thanks should be communicated to him for his very able guidance of the department during the last four years.

By order of the Government of Bombay
(Transferred Departments),

H. V. R. IENGAR,
Under Secretary to Government.

G. R. No. P. 57/2433, R. D., dated the 4th April 1932.

To

The Commissioner in Sind,
The Commissioners of Divisions,
All Collectors, including the Deputy Commissioner, Upper Sind Frontier,
The Chief Conservator of Forests,
The Conservators of Forests, Northern, Central, Southern and Sind Circles,
The Senior Superintendent of Land Records, C. D.,
The Director of Agriculture,
The Accountant General,

Digitized with financial assistance from
Government of Maharashtra
on 24 February, 2020

The Director of Industries,
The Compiler, General Administration Report,
The Director of Information and Labour Intelligence,
The Oriental Translator to Government,
The Secretary, Legislative Council (for the Reading Room for the Members of the Legislative Council),
The General Department,
The Finance Department,
The Public Works Department,
H. L. Newman, Esquire, C.I.E.,
The Secretary to the High Commissioner for India, London (by letter).

BOMBAY : PRINTED AT THE GOVERNMENT CENTRAL PRESS.